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A-11

REFUELED MISSION

MAXIMUM RANGE

JP-150

	Weight Lbs.	Fuel Used Lbs.	Dist. N.Mi.	
Return Cruise				
Climb 35,000 to 80,000 ft.	93,950			
		7900	120	
Cruise at 80,000 to 90,000 ft. at M = 3.2	86,050			
		44,950	4550	
Descend to 35,000 ft.	41,100			
		700	100	
				4770
Reserves				
Loiter 1/2 Hr. at 35,000 ft.	40,400			
		1800	0	
Land with 1/2 Hr. Reserve	38,600			
		1800	0	
ZFW	36,800			

A-11
MAXIMUM RANGE REFUELED MISSION ~ JP-150

STAT

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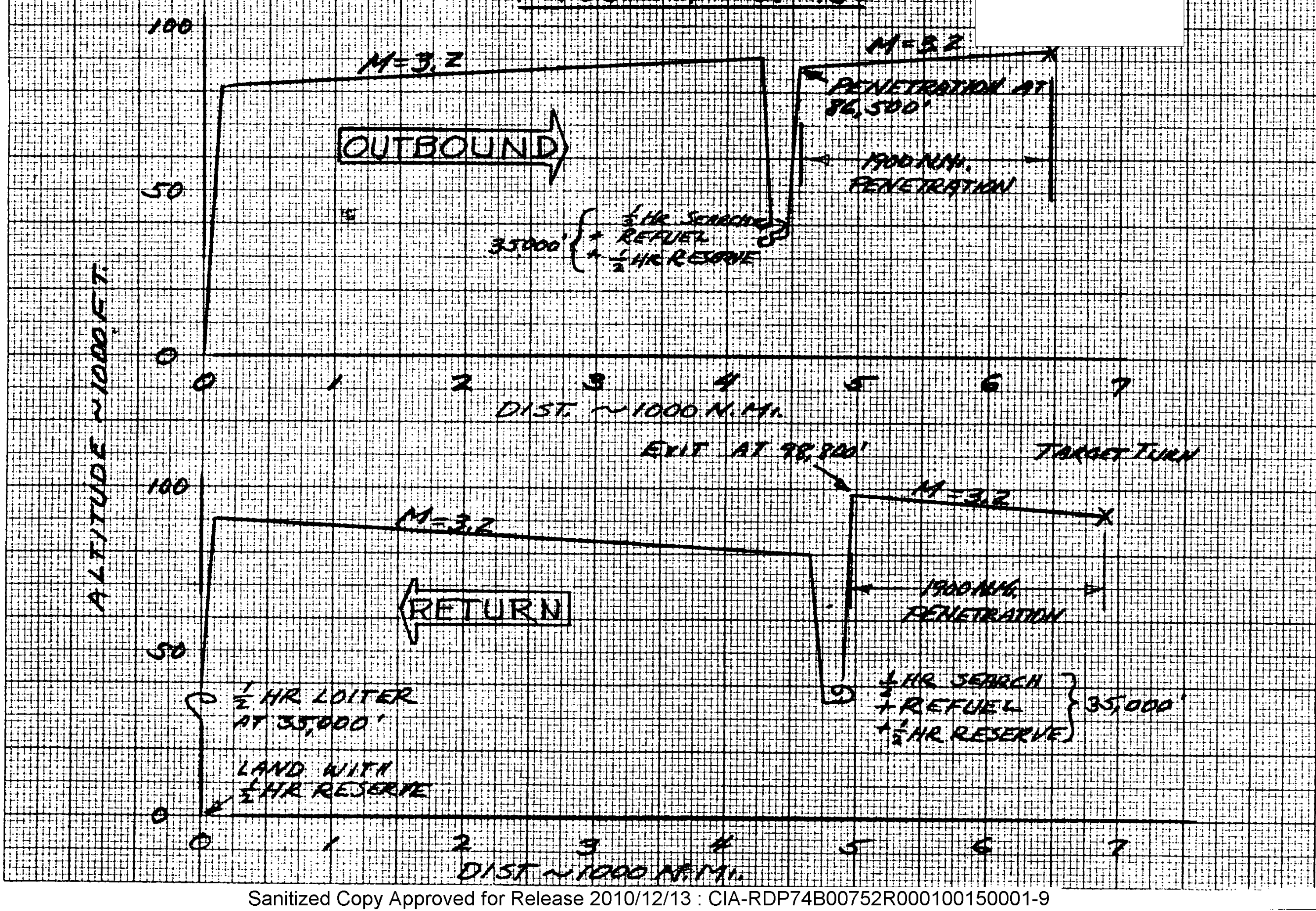


CALIFORNIA DIVISION

REPORT NO.

MODEL COMPARISON WITH 2,000 N.MI. RADIUS

MODEL	A-10	A-11	A-11	A-11A	A-11A
Engine	J-93-3	J-58	J-58	J-93-5	J-93-3
Fuel	JP	HEF & JP	JP	HEF & JP	JP
Wing Area (sq.ft.)	1400	1600	1600	1400	1400
Aspect Ratio	1.5	2.0	2.0	2.0	2.0
Taper Ratio	.123	0	0	0	0
Fuse Dia (in)	60	63.5	63.5	63.5	63.5
Fuse Length (ft)	105	103	103	103	103
L/D	6.5	6.3	6.3	6.3	6.3
Weights					
Zero Fuel (lbs)	33,300	36,800	36,800	33,400	33,400
Total Fuel	52,700	48,000	55,330	46,000	52,540
Take-Off	86,000	84,800	92,130	79,400	85,940
Take-Off Fuel	2,000	1,700	1,930	1,600	1,790
Begin Climb	84,000	83,100	90,200	77,800	84,150
Climb Fuel	12,400	9,000	9,700	9,200	9,950
Begin Cruise	71,600	74,100	80,500	68,600	74,200
Target Wt.	51,700	54,500	57,000	50,100	52,200
End Cruise	35,300	38,600	38,600	35,000	35,000
Reserve Fuel	2,000	1,800	1,800	1,600	1,600
Altitudes					

STAT

Climb Dist.	350	220	220	250	250

Lockheed Aircraft Corporation

CALIFORNIA DIVISION

REPORT NO.	SP114 - Appendix
DATE	March 24, 1959
COPY NO.	Copy #2

MODEL	A-11A
TITLE	PROPOSAL - A-11 APPENDIX

PREPARED [redacted] STAT

[redacted]

Approved [redacted] STAT

Clarence L. Johnson
Vice President
Advanced Development Projects

REVISIONS

DATE	PAGES AFFECTED

FORM 402-1

Lockheed AIRCRAFT CORPORATION

CALIFORNIA DIVISION

A-11

APPENDIX

TABLE OF CONTENTS

FORM 5787A 1

Lockheed AIRCRAFT CORPORATION

CALIFORNIA DIVISION

A-11A SUMMARY

The A-11A airplane presented in this appendix is proposed ONLY in the event that the more suitable Pratt & Whitney J-58 engines should be unavailable for use in the A-11 airplane. The General Electric J-93 engine is the only other potentially available engine in this speed and altitude regime. While not as outstanding as the J-58, the J-93 nevertheless can be used in the design of a vehicle with quite respectable performance.

The A-11A airplane is designed around two (2) General Electric J-93 afterburning engines using HEF type fuel in the afterburners and JP-150 in the engines. The fuel load is approximately 65% HEF and 35% JP-150. Below 10,000 feet no HEF fuel is burned in order to avoid undesirable smoke and contamination.

The airplane has a 2,000 n.mi. mission radius at Mach 3.2 and crosses the target at [redacted] feet as shown in Figure 1 in the "Performance" section STAT of this Appendix. This target altitude is 3,300 feet lower than for the J-58 powered airplane as shown in Figure 1 in the "Performance" section of the main Report.

The configuration is as shown in Figure 1 in the "General Description" section of this Appendix. This configuration is essentially the same as for the A-11 airplane except that it is scaled down, as practical, so as to

A-11A SUMMARY

be compatible with the smaller J-93 engines. However, the fuselage diameter is not scaled down since the space provisions for the pilot and payload is considered to be a practical minimum on the A-11 airplane.

In the "Alternate Fuel" section of this Appendix it is shown that the A-11A airplane can use JP-150 entirely and accomplish the same 2,000 n.mi. mission radius at approximately 1500 feet less altitude at start of cruise and reaching [redacted] feet over target. This altitude performance STAT with JP-150 fuel is 300 feet less over target than the A-10 airplane presented in February 1959. The A-11A airplane, using only JP-150, is essentially the same as the A-10 airplane. However, the fuselage of the A-11A airplane is 3 1/2" larger in diameter than the fuselage of the A-10, resulting in a slightly lower lift/drag ratio for the A-11A airplane.

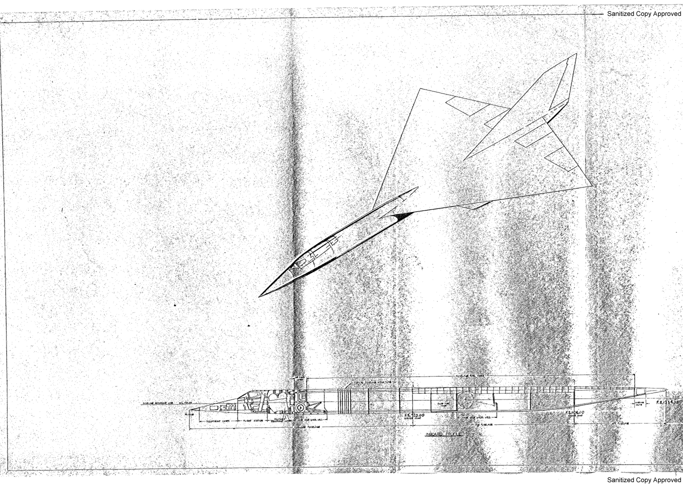
A-11A GENERAL DESCRIPTION

The A-11A airplane is a very high altitude Mach 3.2 reconnaisance vehicle designed to perform the same mission as the A-11, but at slightly lower altitudes, using J-93 engines.

The configuration is identical to the A-11, except that wing area is decreased by 200 sq.ft. and fuselage length reduced slightly. Military equipment bay, pilot's compartment and airplane equipment provisions are dimensionally identical to the A-11 airplane.

Structural arrangement and airplane systems are also the same as proposed for the A-11. The lighter and lower thrust J-93 engines result in a lighter airplane, as summarized below.

Weight Empty	32,415
Oxygen, Oil, Unusable Fuel	200
Pilot	285
Payload	500
Zero Fuel Weight	33,400 lbs.
Fuselage Fuel	32,000
Wing Fuel	14,000
Take-off Weight	79,400 lbs.



WING –

AREA	1404.50 SQ.FT.
ASPECT RATIO	2.00
TAPER RATIO	0.00
ROOT CHORD	53.00 FT. (636.00 IN)
TIP CHORD	0.00
SPAN	53.00 FT. (636.00 IN)
DIHEDRAL	0°
INCIDENCE	0°
AIRFOIL – MOD. BICONVEX	2.5%
SWEEPBACK AT .25C	47.73°
M.A.C. AT WING STA. 106.00	424.00 IN.

ELEVON –

AREA (TOTAL)	125.83 SQ.FT.
TRAVEL	UP 22° DOWN 18°

VERTICAL TAIL –

AREA	253.11 SQ.FT.
ASPECT RATIO	.508
TAPER RATIO	.301
ROOT CHORD	34.33 FT. (412.00 IN)
TIP CHORD	10.33 FT. (124.00 IN)
SPAN	11.33 FT. (136.00 IN)
AIRFOIL – MOD. BICONVEX	ROOT 3% TIP 2%
SWEEPBACK AT .25C	61.29°
M.A.C. AT FIN STA. [illegible]	293.79 IN.

RUDDER –

AREA	47.22 SQ.FT.
TRAVEL	27.50°

FUSELAGE –

MAXIMUM DEPTH	5.29 FT. (63.50 IN)
MAXIMUM WIDTH	5.29 FT. (63.50 IN)
OVERALL LENGTH	102.42 FT. (1229.00 IN)
FRONTAL AREA	21.99 SQ.FT.

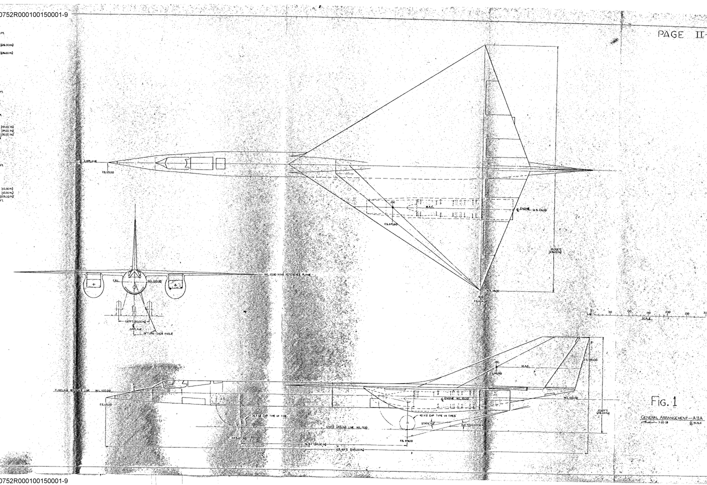


FIG. 1

GENERAL ARRANGEMENT – A11A

3-20-59 1/50 SCALE

PERFORMANCE

The A-11A configuration is capable of 2,000 n.mi. radius mission cruising at Mach 3.2 at altitudes from 85,000 feet to [redacted] feet. The mission is summarized on Figure 1 and a distance-weight profile is shown on Figure 2. Airplane performance is summarized on Figure 3. STAT

The mission comprises a full power take-off, climb and cruise. Fuel allowance for take-off and acceleration to climb speed is one minute at full power.

The climb performance is shown on Figure 4. The sea level rate of climb is 22,650 feet per minute and decreases with altitude to about 2,500 feet per minute at 74,000 feet. This part of the climb is made at a constant EAS of 400 Knots and an increasing true speed. Consequently a large part of the excess thrust is required for acceleration. Above 74,000 feet the climb is made at a constant Mach 3.2 and all of the excess thrust is available for climb. At 74,000 feet the rate of climb increases to 19,000 feet per minute and thereafter decreases rapidly to zero at 85,000 feet, the start of cruise. The climb uses 9,200 pounds of fuel, covers 250 n.mi., and requires 12.82 minutes.

The climbing cruise is made at maximum power at Mach 3.2. The cruise time is 2.08 hours including a 180 degree turn at the target point 2,000 n.mi. from take-off at an altitude of 91,000 feet. The end of cruise is at 95,000 feet over the base at Mach 3.2. An actual mission would include an idle

PERFORMANCE (cont.)

power descent starting 150 to 200 n.mi. from the base and would use less fuel than continuing the cruise to the base at altitude. A reserve allowance is included for a single engine 30-minute loiter at subsonic speeds at 35,000 feet altitude.

The take-off and the landing ground roll are 2,600 and 2,800 feet respectively. Speeds required for take-off and landing are based on an angle of attack of 11 degrees, which is the clearance angle with the main gear struts compressed. This provides an adequate ground clearance margin over the 15.5 degrees provided with the gear struts extended. Single engine safety during take-off is excellent since the total airplane drag is less than 20,000 pounds including dead engine and trim drag and the operating engine provides about 27,000 pounds of thrust. Single engine performance during landing is, of course, better due to the reduced weight.

Figure 1

A-11A MISSION SUMMARY

(Two G.E. J93-5 Engines)

	Weight Lbs.	Fuel Lbs.	Dist. N.Miles	Alt. Ft.
T.O.	79,400	1,600	0	S.L.
Climb	77,800	9,200	250	S.L.
Cruise Out	68,600	18,500	1,750	85,000
Target	50,100	-	-	91,000
Cruise Back	50,100	15,100	2,000	95,000
Reserve (30 min.)	35,000	1,600	-	35,000
ZFW	33,400	-	-	-

Radius 2,000 n.mi. (180° turn at target)

46,000 Lbs. Total
(30,000 lbs. HEF used in afterburner,
16,000 lbs. JP150 used in primary)

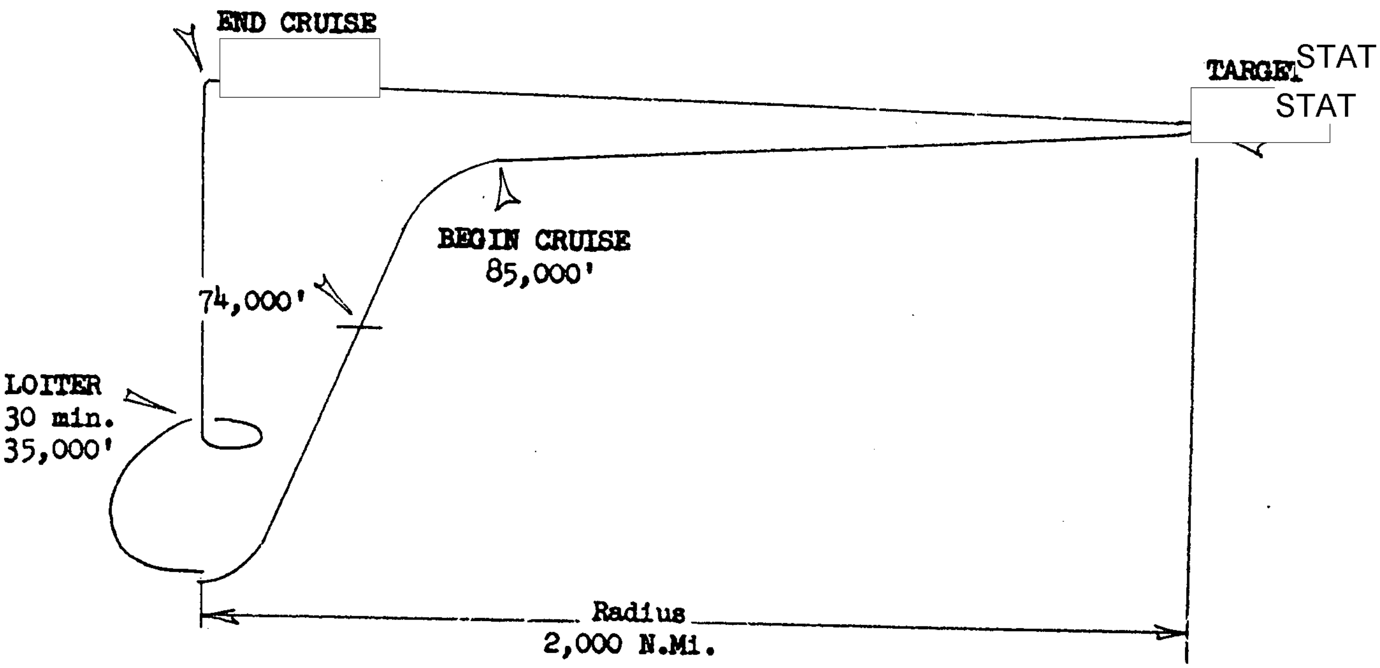


FIGURE 2

A-11A

WEIGHT-DISTANCE PROFILE

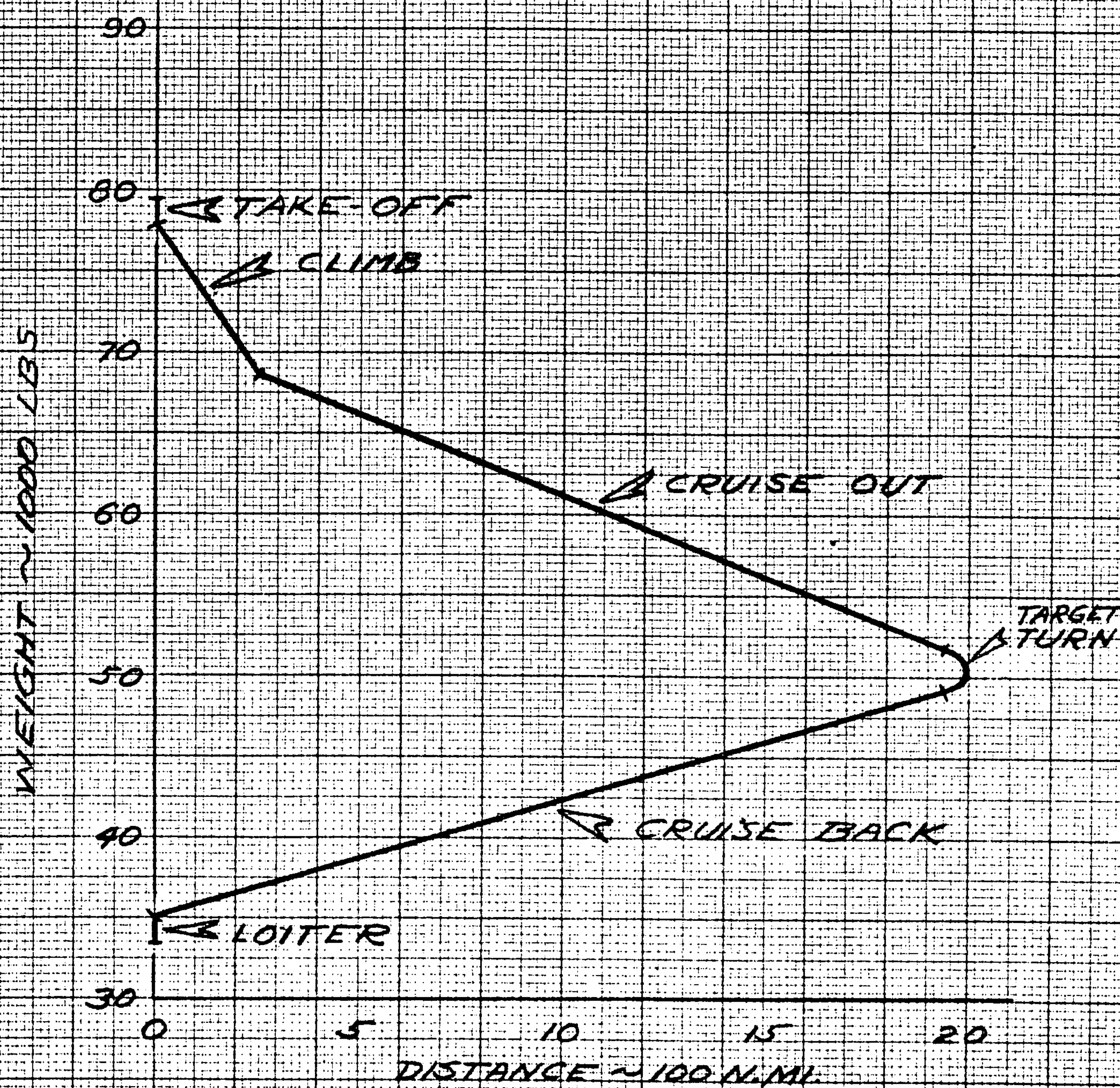


Figure 3

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A-11A PERFORMANCE SUMMARY

Radius	2,000 n.mi.
Take-off	
Weight (lbs.)	79,400
Speed (Kts)	191
Take-off Ground Roll (Feet)	2,600
Rate of Climb at S.L. at 400 Kts.(Ft./Min.)	22,050
Cruise	
Mach No.	3.2
Speed (Kts)	1,865
Altitude (Feet)	85,000 t [redacted] STAT
Target	
Altitude (Feet)	[redacted] STAT
Weight (Lbs.)	50,100
Landing	
Weight (Lbs.)	35,000
Speed (Kts)	127
Distance (Feet)	2,800

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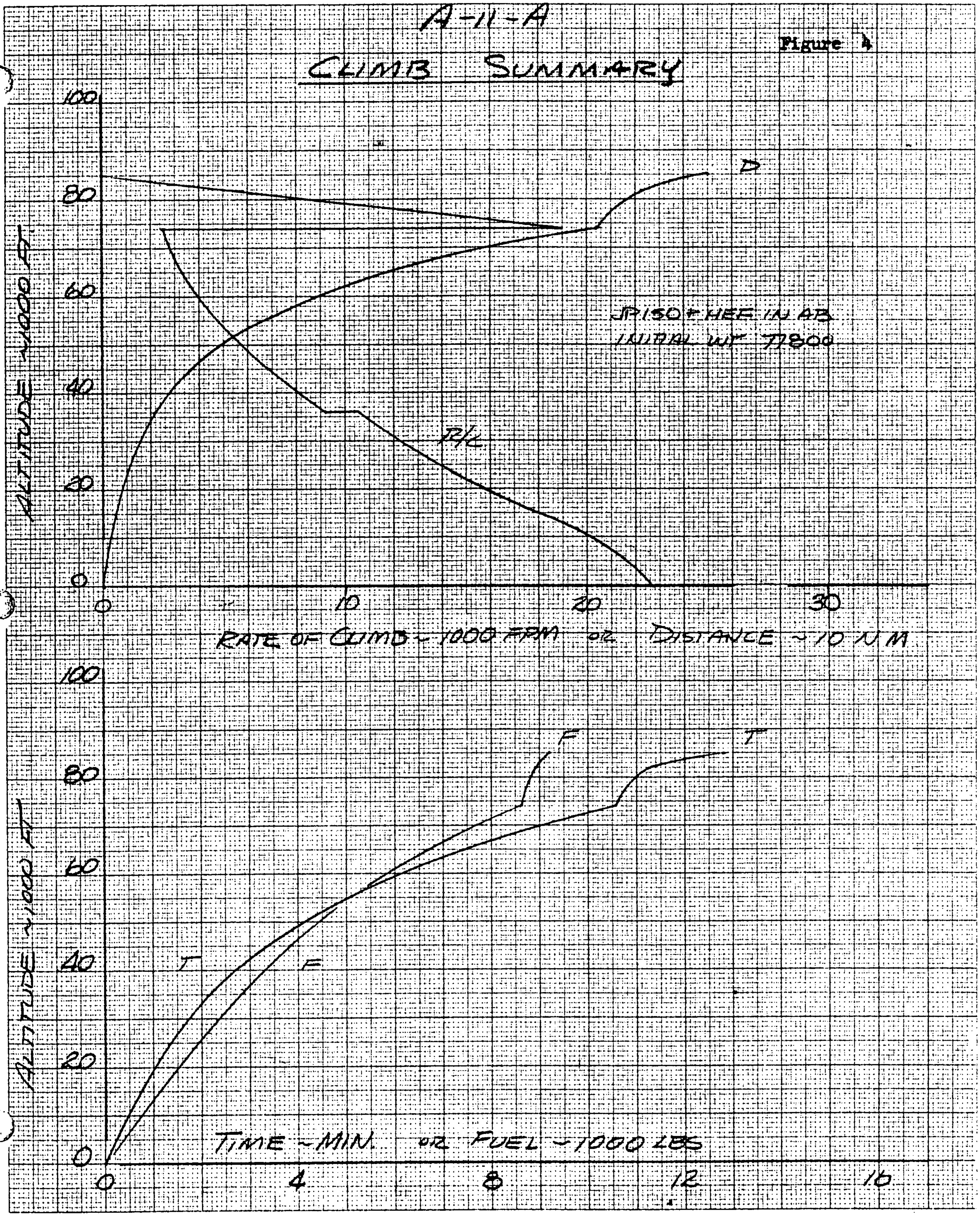

FORM 5278 A

STRUCTURAL DESCRIPTION

This section covers the significant weight and structural changes between the A-11 configuration and the A-11A. Section IV of the main report gives a detailed coverage of the weight and structure of the A-11. The A-11A has smaller wing and tail, and J93 engines replace the J58 engines; these are the essential differences in the two configurations.

A weight of 4,990 lb. each is used for the J93 engine, this includes HEF provisions and self contained oil and starter systems. The weight summary is given on the following page and the center of gravity envelope is shown on Figure 1.

The wing structure has been investigated for the external loads given in Figure 2. The internal loads are not substantially different from those in the A-11 wing; the same type of wing structure will be used. The A-11 wing skin gauge is unchanged; this produces slightly higher aileron reversal speeds for the A-11A. Figure 4 gives design speeds and aileron reversal speeds. All other loads and speeds are contained in Section IV of the main report.

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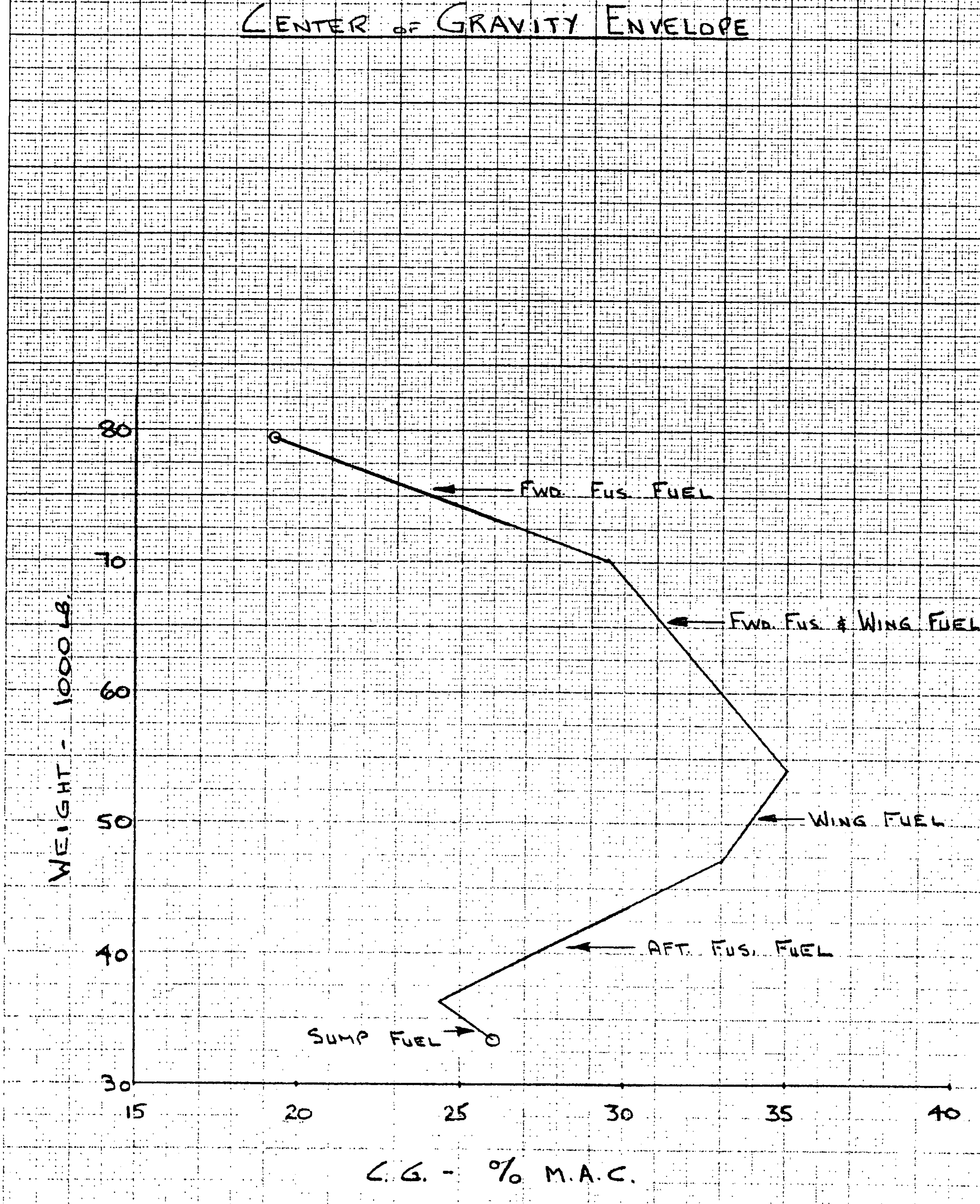
WEIGHT SUMMARY

WING	8,160
FIN	1,320
FUSELAGE	4,550
LANDING GEAR	1,900
SURFACE CONTROLS	1,070
NACELLES	1,900
PROPULSION GROUP	11,160
INSTRUMENTS	110
HYDRAULICS	550
ELECTRICS	300
ELECTRONICS	425
FURNISHINGS	150
AIR CONDITIONING	750
TAIL PARACHUTE	70
WEIGHT EMPTY	32,415
OXYGEN	40
OIL	60
UNUSABLE FUEL	100
PILOT	285
PAYLOAD	500
ZERO FUEL WEIGHT	33,400
FUSELAGE FUEL	32,000
WING FUEL	14,000
TAKE-OFF WEIGHT	79,400

FORM 5767A 1

FIG. 1


CENTER OF GRAVITY ENVELOPE
FWD. FUS. FUEL
FWD. FUS. & WING FUEL
WING FUEL
AFT. FUS. FUEL
SUMP FUEL
WEIGHT - 1000 LB.
80
70
60
50
40
30
15
20
25
30
35
40
C.G. - % M.A.C.

 -11A

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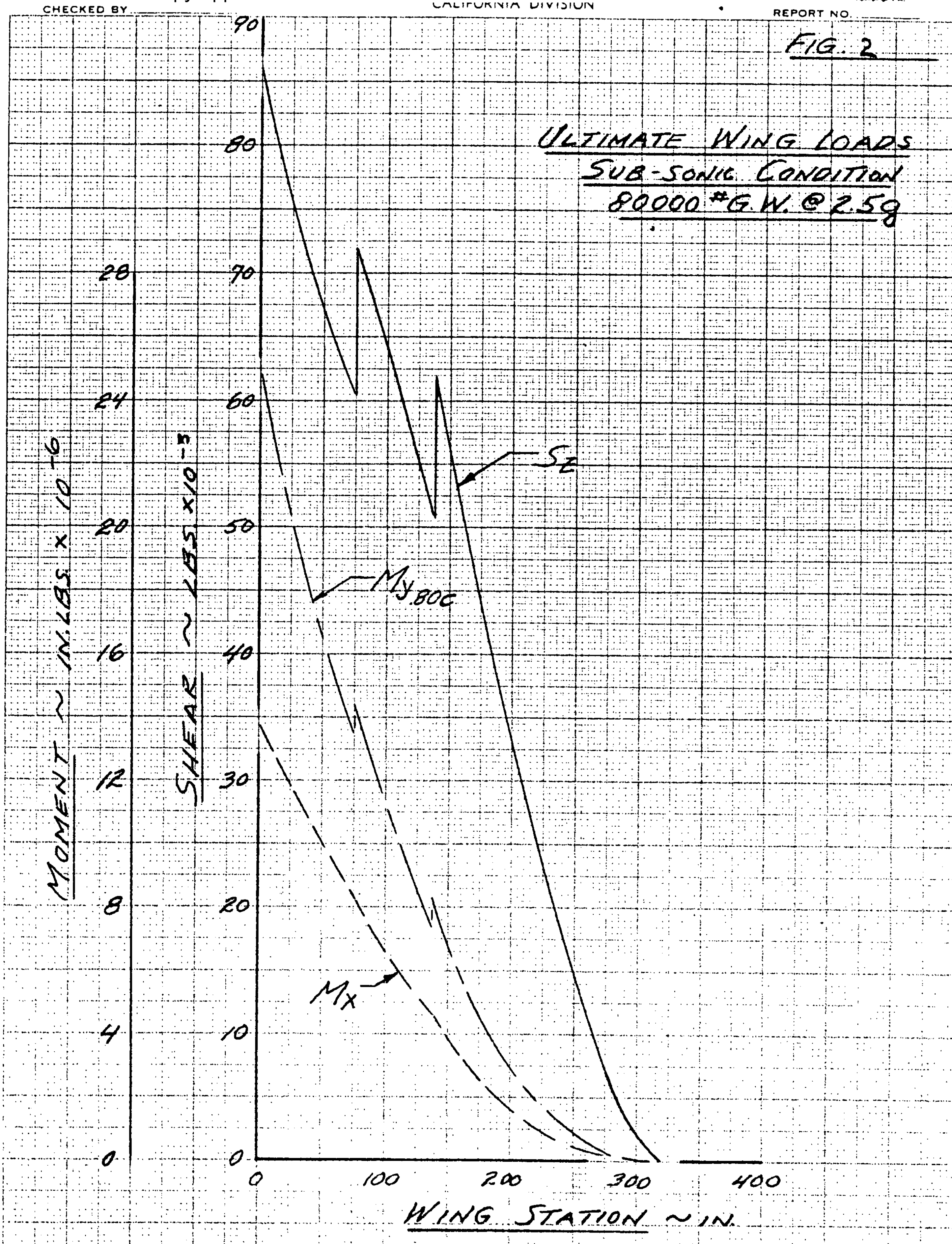
FIG. 2



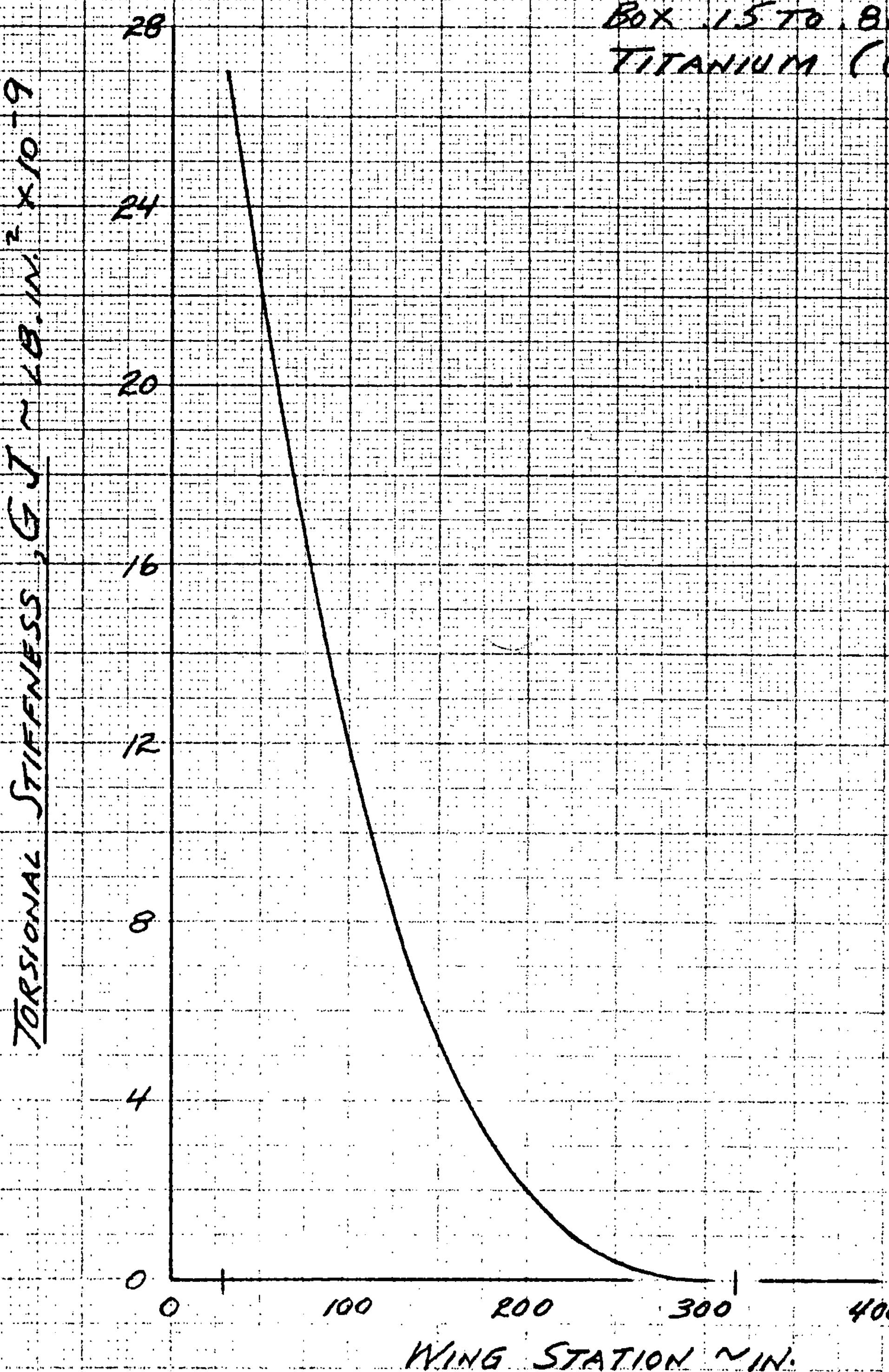
FORM 5278

FIG. 3

WING

TORSIONAL STIFFNESS, GJ

BOX .15 TO .80 C
TITANIUM (G = 6,000,000 PSI)



 -11A

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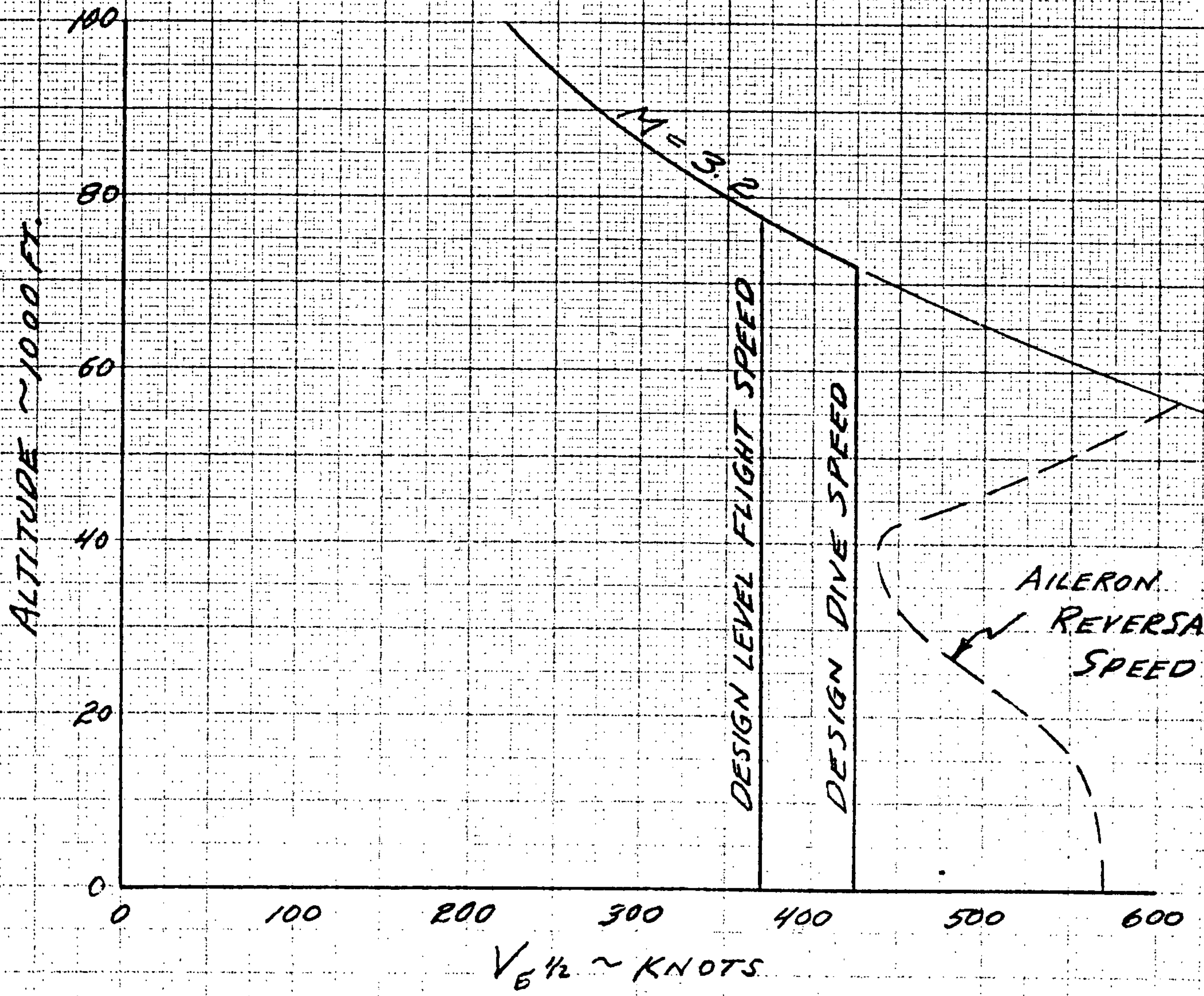
REPORT NO.

FIG. 4

SPEED - ALTITUDE CHART
INCLUDING
AILERON REVERSAL SPEED



FORM 5278

A-11A

THERMODYNAMICS

A. POWER PLANT SYSTEM

I. General Description

The General Electric J-93 turbojet engine was used as the powerplant for the A-11A airplane. This engine was considered as the alternate powerplant since it is the only other powerplant in the speed and altitude range of the A series airplanes which will be available should the J-58 engine program fail to materialize. The thrust to weight ratio of the J-93 engine is inferior to J-58 engine at the M = 3.2, 90,000 feet design condition.

Two versions of the J-93 were used in the analysis, the -5 engine which uses JP-150 fuel in the primary and HEF in the afterburner, and the -3 engine which is an all JP-150 engine.

The engine used in this section is an up-rated J-93 engine. The turbine inlet temperature has been boosted 100°F in the flight speed range from M = 0 to M = 2.0. At higher Mach numbers, the turbine inlet temperature is cut back to the original value.

The -5 and -3 engine performance are based on data presented in G.E. Bulletins R58AGT221 and R58AGT452 respectively, modified for the T.I.T. increase using G.E. curves 4012315-13 and 4012315-11 respectively.

A-11A

THERMODYNAMICS

A. POWER PLANT SYSTEM

I. General Description (cont.)

An engine weight of 4770 lbs. was used for the -3 engine and 4990 lbs. for the -5 engine.

The following are the manufacturer's quoted availability dates for the J-93 engine:

	PFRT	MRT (150 hr.)
-3 engine (all JP-150)	Sept. 1960	Sept. 1961
-5 engine (JP-150 primary HEF in A/B)	March 1963	Nov. 1963

It should be noted that the -5 (HEF) engine availability is approximately two years later than the proposed airplane flight date.

II. Engine Performance

The installed J93-5 and J93-3 engine thrust and fuel flows at maximum power are presented in Figures 1 and 3 respectively. The performance is based on the inlet recoveries shown in Figure 4 of the Thermodynamics Section of Report SP-114. The data are for climb speed of 400 knots E.A.S. up to 74,000 feet and at M = 3.2 above 74,000 feet. Also shown are the uprated turbine inlet temperature data from S.L. to 55,000 feet (M = 2.0), and at normal turbine inlet temperature above 55,000 feet. Figures 2 and 4 show the variation of SFC with afterburner power for the -5 and -3 engines respectively.

A-11A

FIG. 4

ESTIMATED PARTIAL AFTERBURNING PERFORMANCE

G.E. J-93-3 ENGINE

JP-150 FUEL IN PRIMARY & A/B

M = 3.20

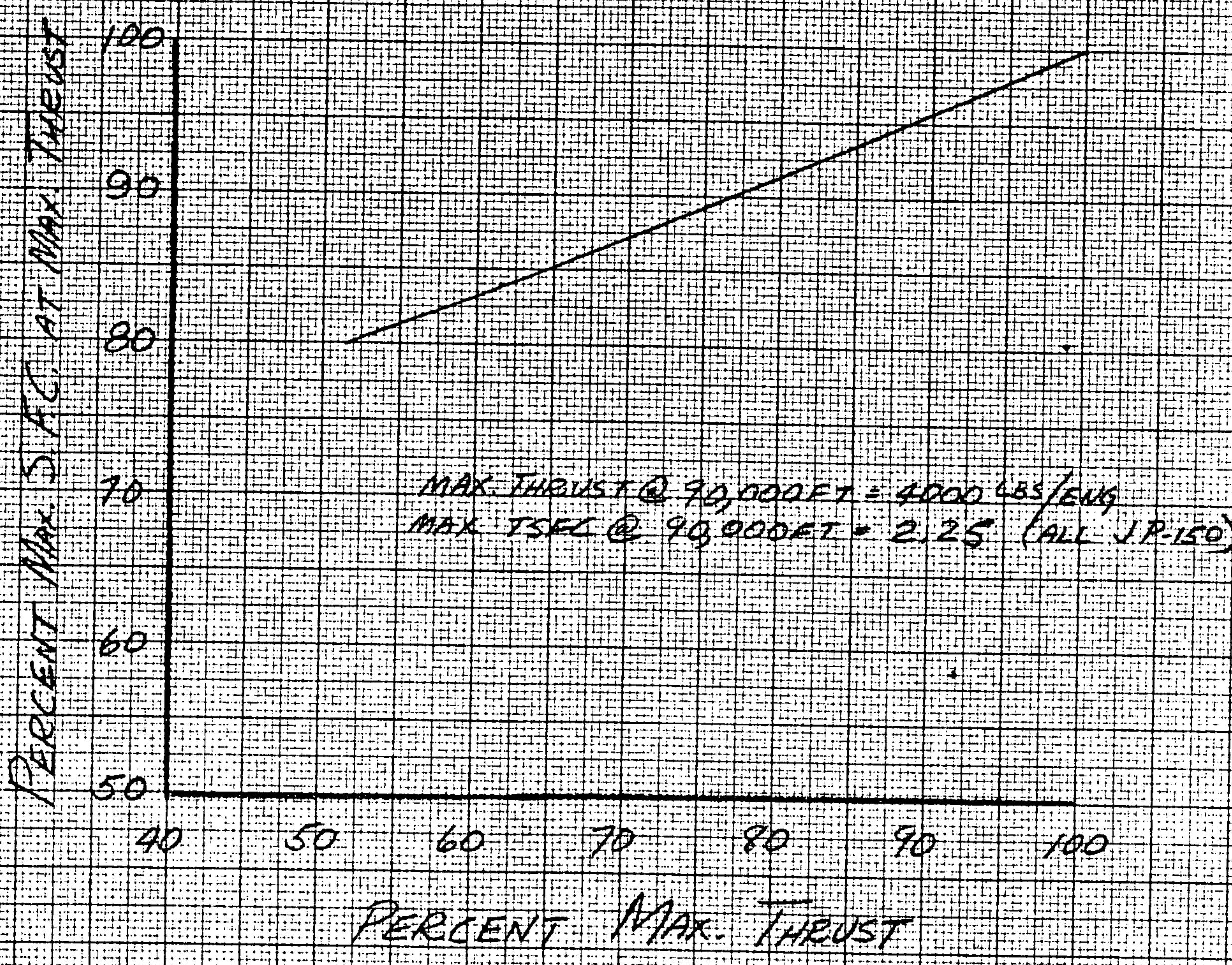


FIG. 4

FORM 527B A

JP-150 MISSION

It is of interest to determine the effect upon airplane performance of using only hydrocarbon fuel. Flight testing of airframe, engine and equipment and crew training as well as some tactical missions can be conducted on a more economical basis with the less exotic fuel.

To accomplish the identical mission radius of the HEF equipped airplane requires a fuel load of 52,540 pounds with a take-off weight of 85,940 pounds. These numbers are 6,540 pounds greater than the HEF equipped airplane. However, the basic airframe will accommodate the greater weight of fuel at the lesser average density because sufficient fuselage diameter and length have already been established by payload and balance considerations.

The increased take-off weight results in a take-off ground run of 3,100 feet. The landing weight is not affected so that the landing distance remains 2,800 feet. The initial penetration altitude is reduced 1,500 feet and the target altitude is reduced 800 feet, also by virtue of the increased flight weight. The performance is otherwise unaffected by the sole use of JP-150 fuel.

It is noted at this point that the use of JP-150 exclusively does not show up to be as much of a disadvantage as might at first be expected. This comes about because the fuselage size and length required by payload and balance requirements can hold more fuel than is compatible with attaining

JP-150 MISSION (cont.)

the highest possible altitude at a 2,000 n.mi. radius using the HEF fuel combination. It therefore appears that the basic airplane (Ref. Figure 1 in "Performance Section") could be overloaded with an HEF fuel combination of 52,540 lbs. With this overload of fuel the mission radius will improve to approximately 2,250 n.mi. with about the same altitude profile as attained with JP-150 fuel alone.

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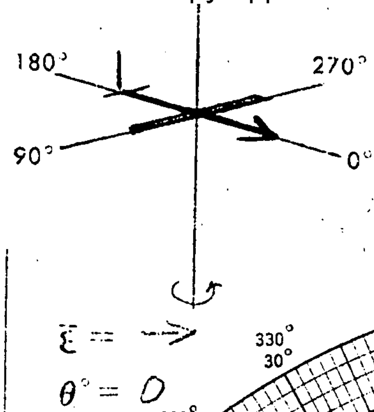
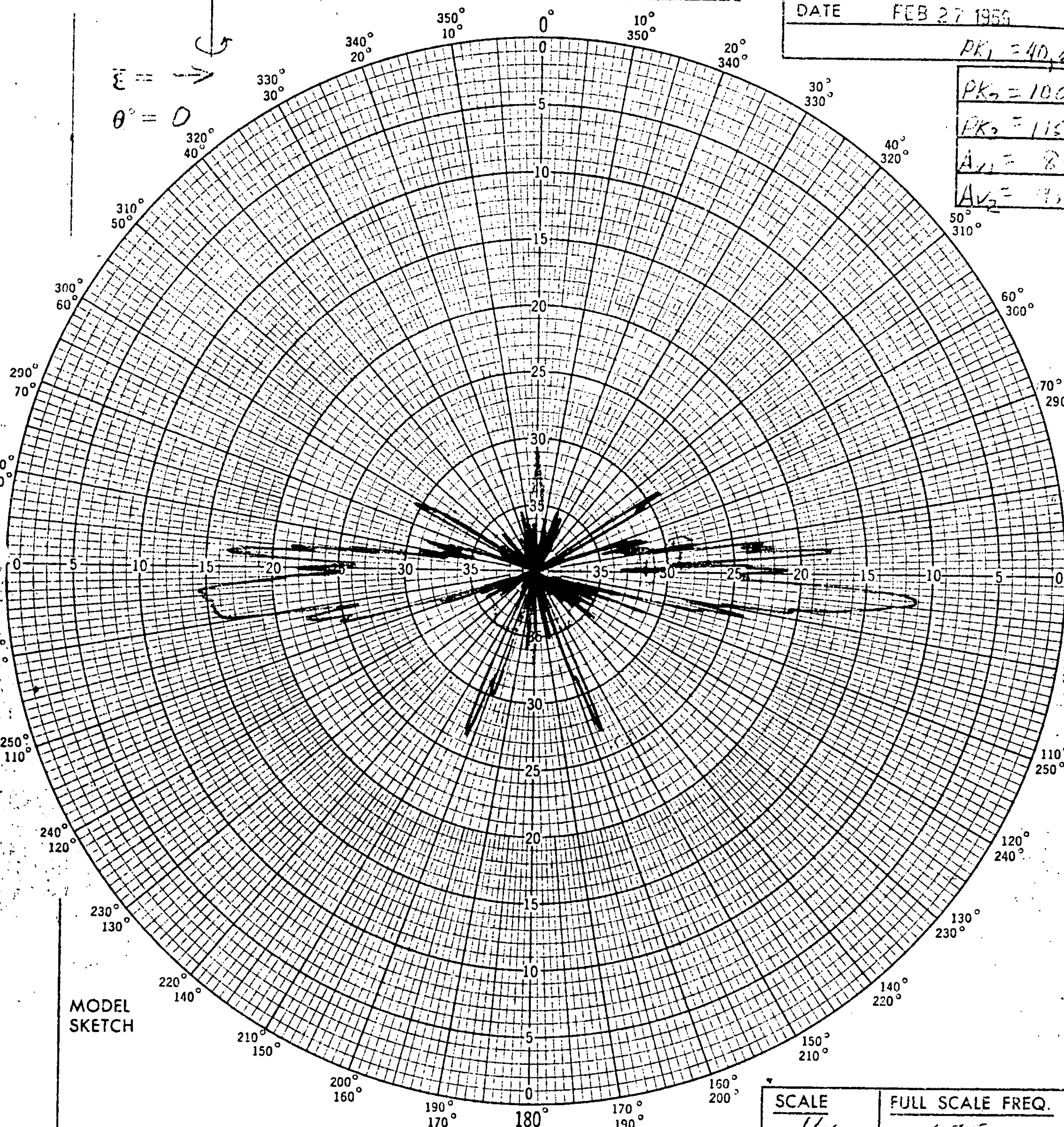


EQUIPMENT NOTES	
SOURCE: S.G.	R. F. ATTEN.: 0
MISC.:	

MODEL NO.	26 N - 2
TEST FREQ.	19 KMC
$\bar{\mathcal{E}}$ //	TO ~~AXIS OF ROTATION~~ TO PLANE OF SAMPLE
RANGE	120
DATE	FEB 27 1959
	PK_1 = 40,0[illegible]

PK_2 = 100 m²
PK_3 = 115 m²
Av_1 = 8 m²
Av_2 = [illegible] m²



MODEL SKETCH

SCALE	FULL SCALE FREQ.
1/40	[illegible]

BASIC MODEL:

A - 10

DETAILS:

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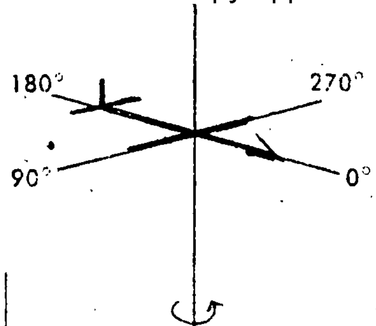
ATLANTA, GEORGIA



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SOURCE: S. G.	R. F. ATTEN.: 0
MISC.:	

MODEL NO.	264-2
TEST FREQ.	19 KMC
Ē //	~~TO AXIS OF ROTATION~~ TO PLANE OF SAMPLE
RANGE	120
DATE	FEB 27 1959
	Pk₁ = 10 m²

Pk₂ = 60 m²

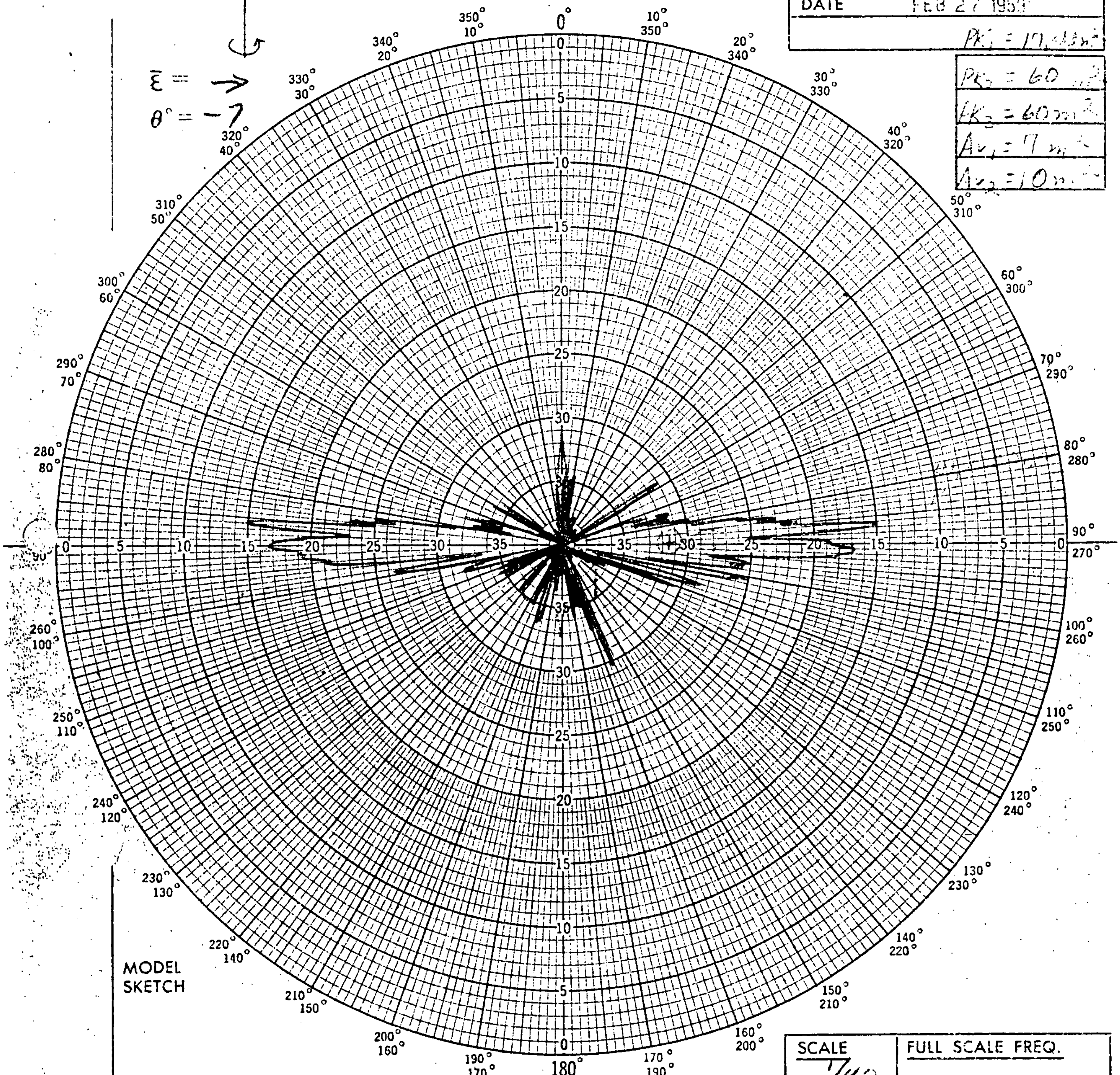
Pk₃ = 60 m²

Av₁ = 7 m²

Av₂ = 10 m²

Ē = →

θ° = −7



MODEL SKETCH

SCALE	FULL SCALE FREQ.
1/40	

BASIC MODEL:

A - 10

DETAILS:

Polar Chart No. 127D
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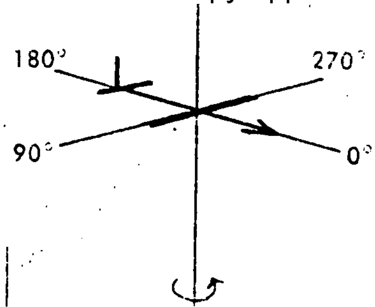

$\bar{\mathcal{E}}$ = →

$\theta°$ = −11

EQUIPMENT NOTES	
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MISC.:	

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$\bar{\mathcal{E}}$ //	~~TO AXIS OF ROTATION~~ TO PLANE OF SAMPLE
RANGE	120
DATE	FEB 27 1959
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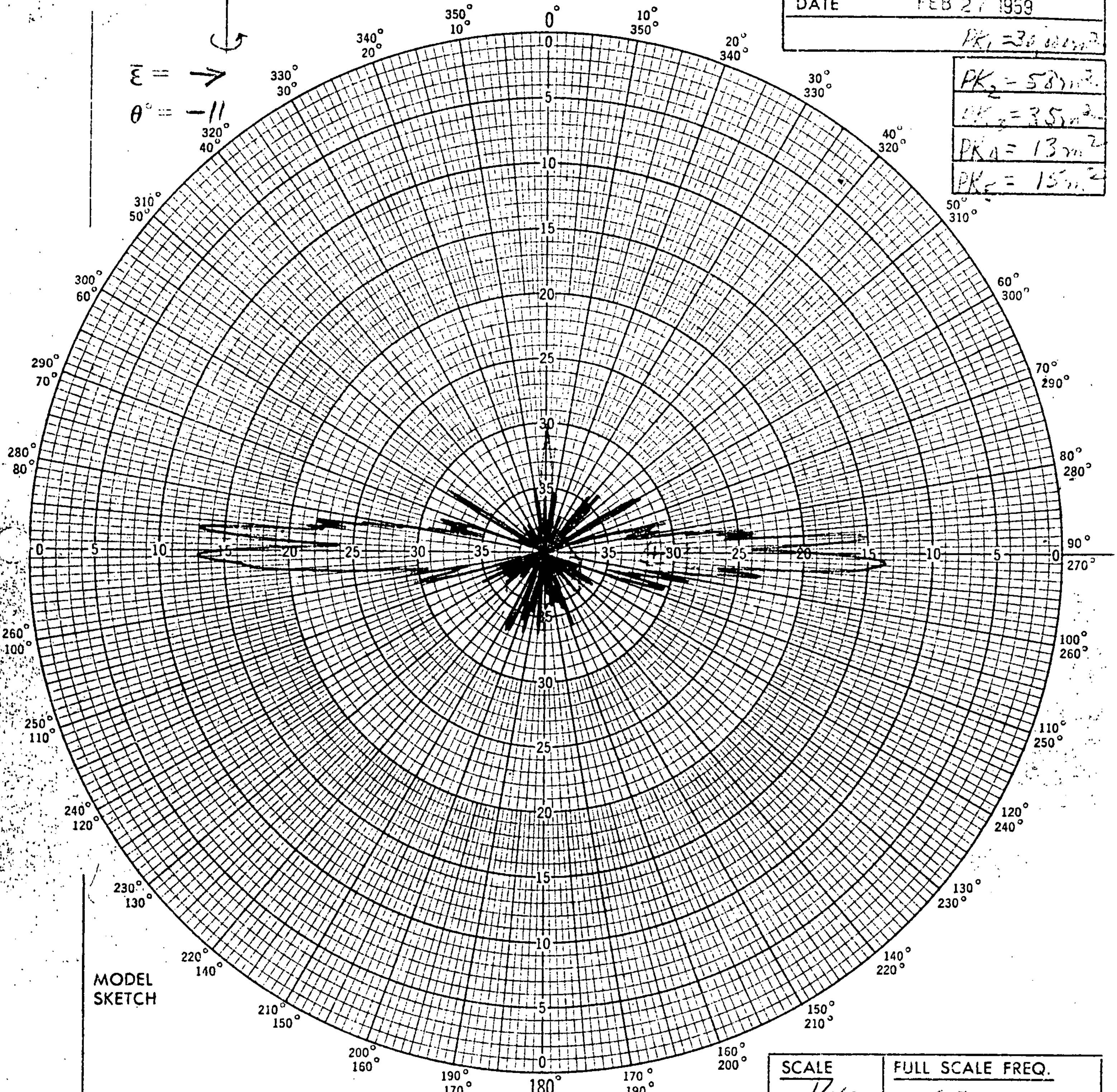
PK_2 = 58 m^2

PK_3 = 35 m^2

PK_4 = 13 m^2

PK_5 = 15 m^2



MODEL SKETCH

SCALE	FULL SCALE FREQ.
1/40	

BASIC MODEL:

A - 10

DETAILS:

Polar Chart No. 127D
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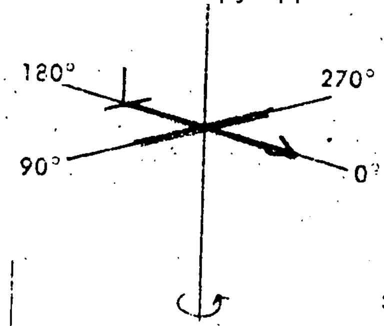
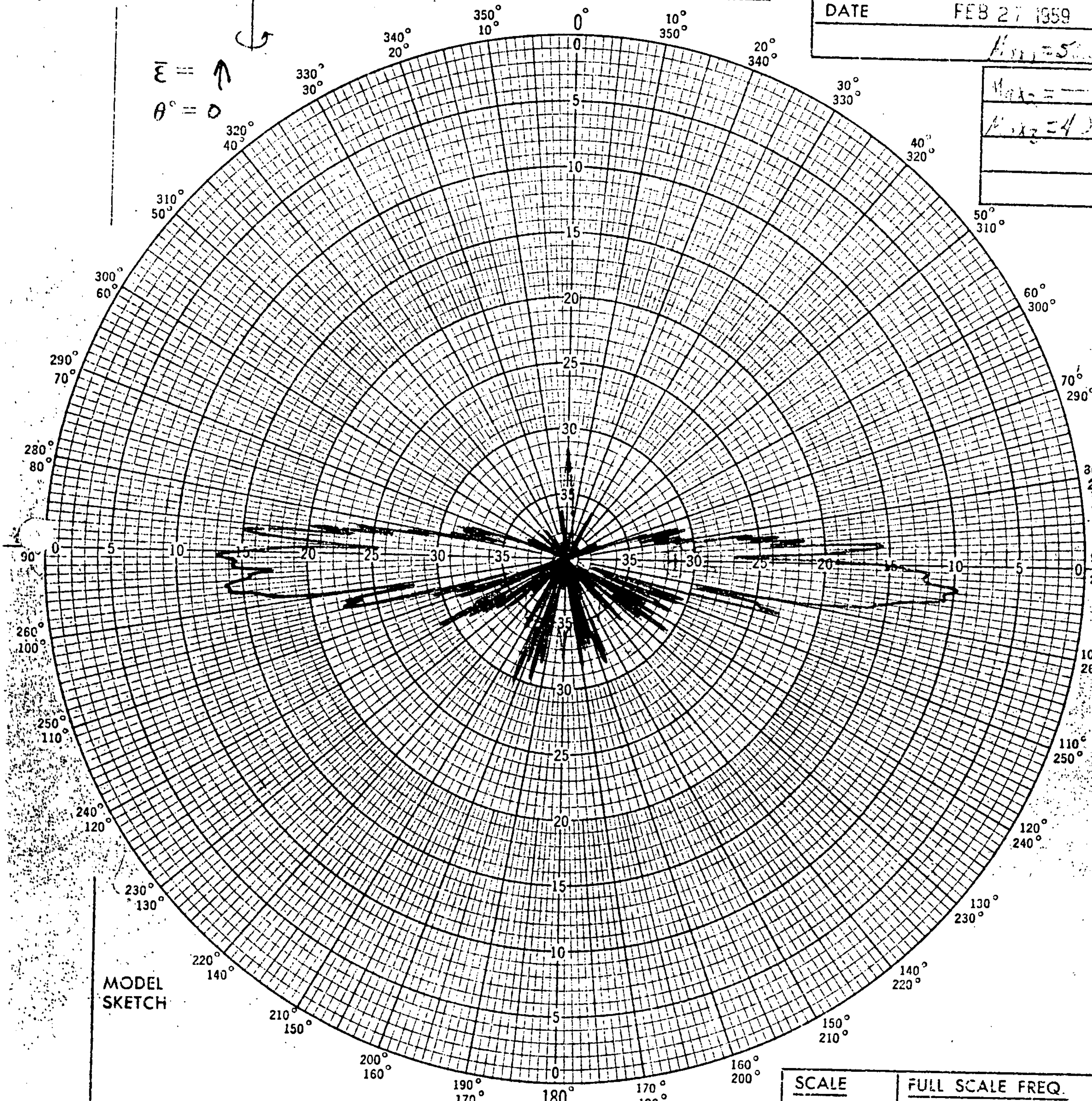
ATLANTA, GEORGIA



EQUIPMENT NOTES	
SOURCE: S. G.	R. F. ATTEN.: 0
MISC.:	

MODEL NO.	264 - 2
TEST FREQ.	19KMC
Ē ⊥	~~TO AXIS OF ROTATION~~ TO PLANE OF SAMPLE
RANGE	120
DATE	FEB 27 1959
Max = 50 ... m²	
Max₁ = ——	
Max₂ = 4 ... m²	



MODEL SKETCH

SCALE	FULL SCALE FREQ.
1/40	

BASIC MODEL: A - 10

DETAILS:

Polar Chart No. 127D
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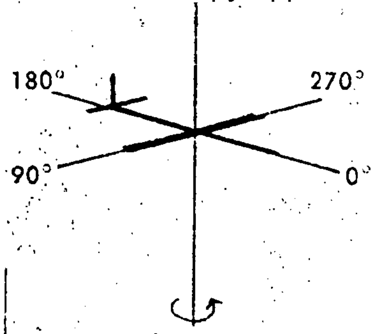
ATLANTA, GEORGIA



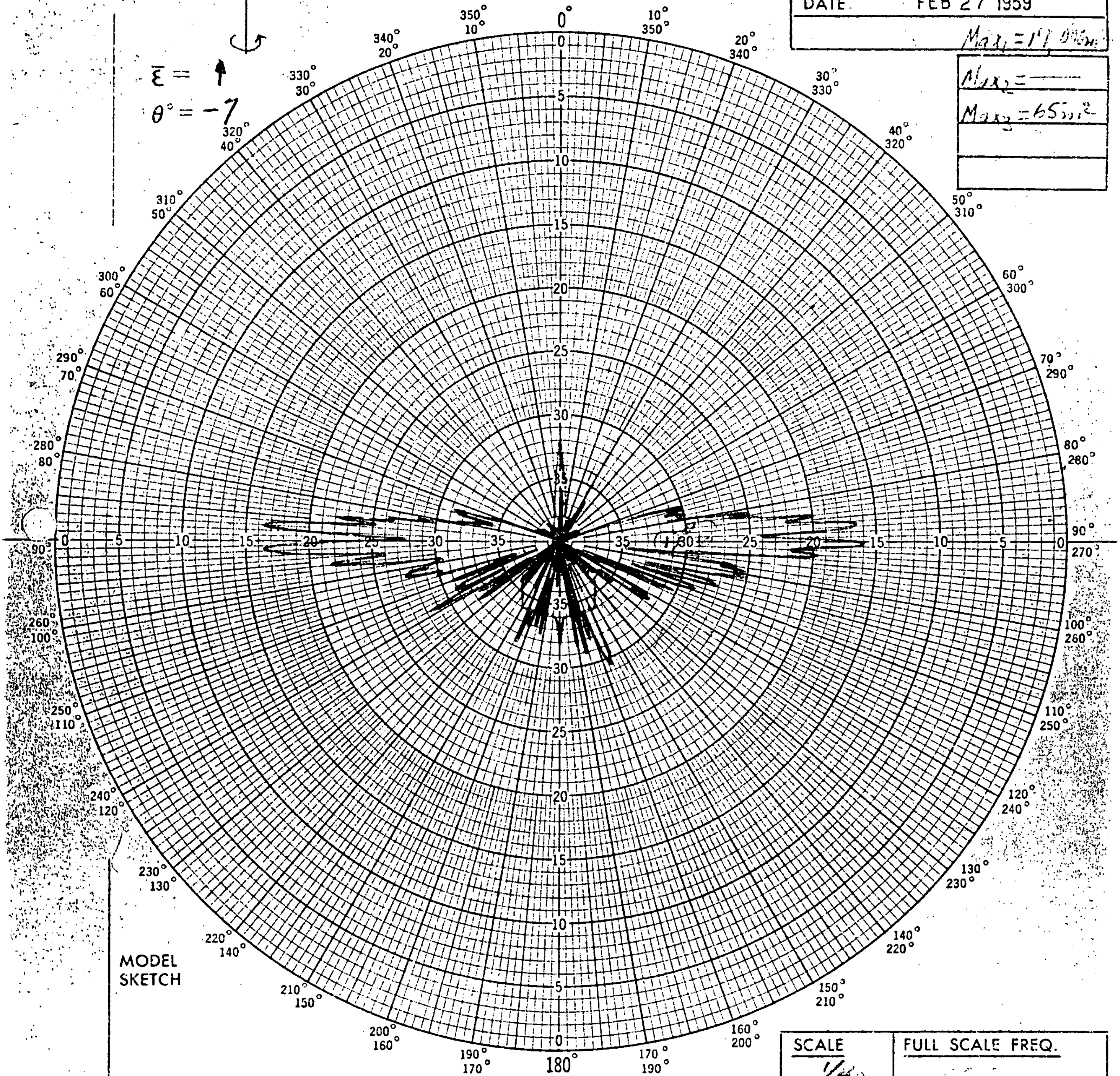
$\overline{\mathcal{E}}$ = ↑

θ° = -7

EQUIPMENT NOTES	
SOURCE: S.G.	R. F. ATTEN.: 0
MISC.:	

MODEL NO.	264-2
TEST FREQ.	19 KMC
Ɛ ⊥	~~TO AXIS OF ROTATION~~ TO PLANE OF SAMPLE
RANGE	120
DATE	FEB 27 1959
	Max₁ = 1.7 m²

Max₂ = ——
Max₃ = .65 m²



MODEL SKETCH

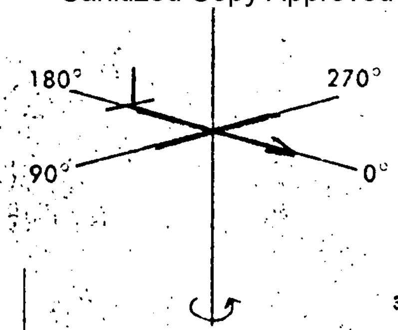
SCALE	FULL SCALE FREQ.
1/40	

BASIC MODEL:

A - 10

DETAILS:

Polar Chart No. 127D
SCIENTIFIC-ATLANTA, INC.
ATLANTA, GEORGIA



$\bar{\varepsilon} = \uparrow$

$\theta° = -11$

EQUIPMENT NOTES	
SOURCE: S.G	R.F. ATTEN.: 0
MISC.:	

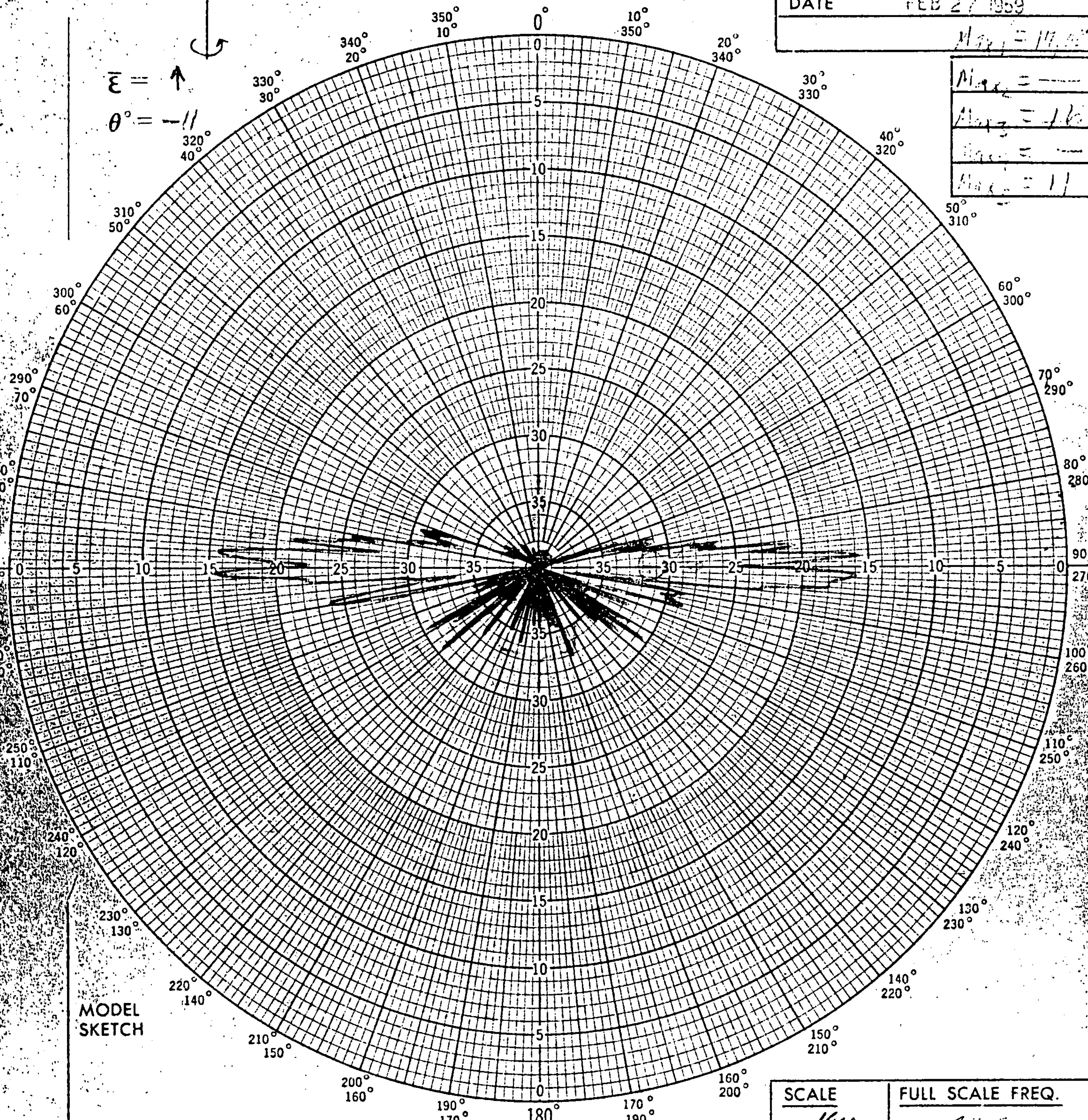
MODEL NO.	264-2
TEST FREQ.	19KMC
$\bar{\varepsilon}$ ⊥	~~TO AXIS OF ROTATION~~ TO PLANE OF SAMPLE
RANGE	120
DATE	FEB 27 1959

Max = ----

Max = 16

Max = --

Max = 11



MODEL SKETCH

SCALE	FULL SCALE FREQ.
1/40	

BASIC MODEL: A-10

DETAILS:

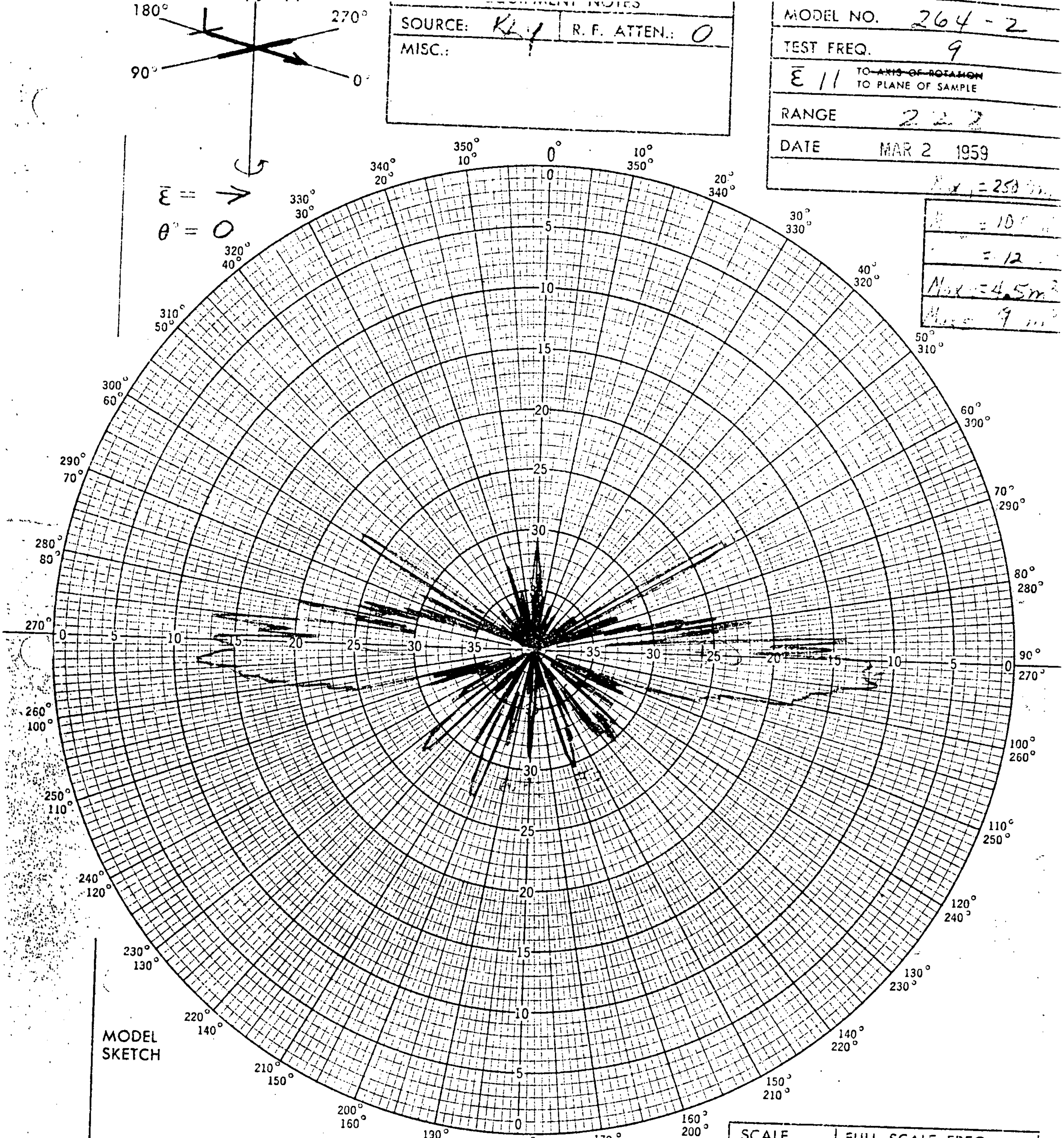
Polar Chart No. 127D
SCIENTIFIC-ATLANTA, INC.
ATLANTA, GEORGIA

SOURCE: KL-1	R. F. ATTEN.: 0
MISC.:	

MODEL NO.	264 - 2
TEST FREQ.	9
$\bar{E}$ //	~~TO AXIS OF ROTATION~~ TO PLANE OF SAMPLE
RANGE	2 2 2
DATE	MAR 2 1959

$\bar{E}$ = →

θ = 0



MODEL SKETCH

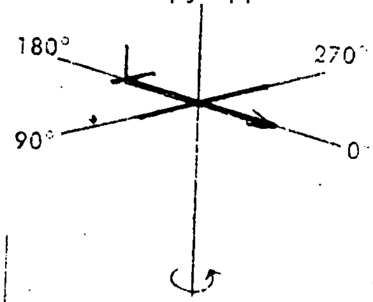
SCALE	FULL SCALE FREQ.
1/20	

BASIC MODEL:

A - 10

DETAILS:

Polar Chart No. 127D
SCIENTIFIC-ATLANTA, INC.
ATLANTA, GEORGIA



$\bar{\varepsilon}$ = →

$\theta°$ = -7

EQUIPMENT NOTES	
SOURCE: KLY	R. F. ATTEN.: 0
MISC.:	

MODEL NO.	264-2
TEST FREQ.	9
$\bar{\varepsilon}$ //	~~TO AXIS OF ROTATION~~ TO PLANE OF SAMPLE
RANGE	228
DATE	MAR 2 1959

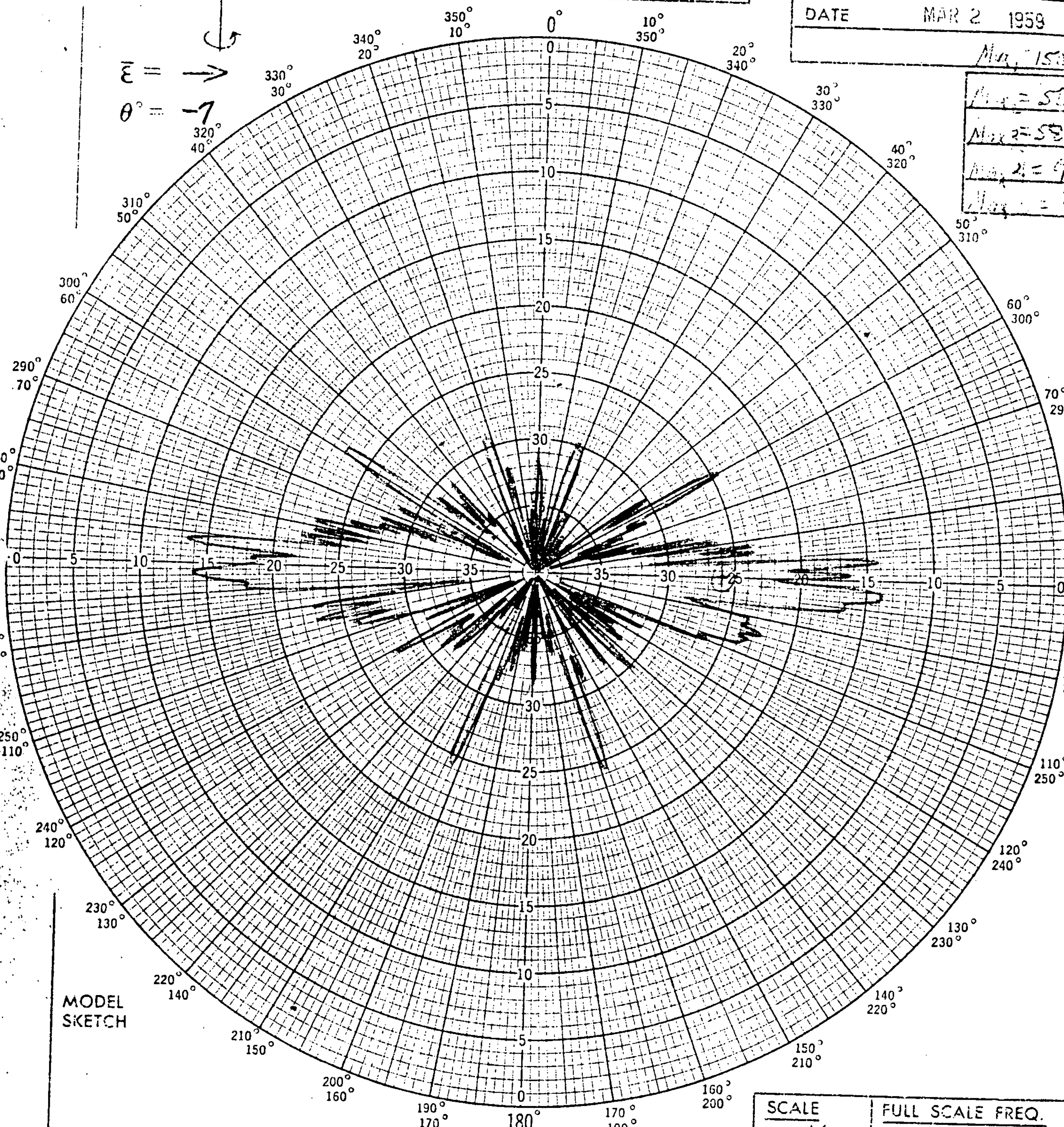
Max 1500 m

Max = 50

Max 2 = 58 m

Max 2 = 9

Max = 7



MODEL SKETCH

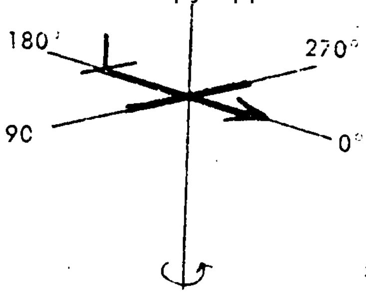
SCALE	FULL SCALE FREQ.
1/40	

BASIC MODEL:

A-12

DETAILS:

Polar Chart No. 127D
SCIENTIFIC-ATLANTA, INC.
ATLANTA, GEORGIA

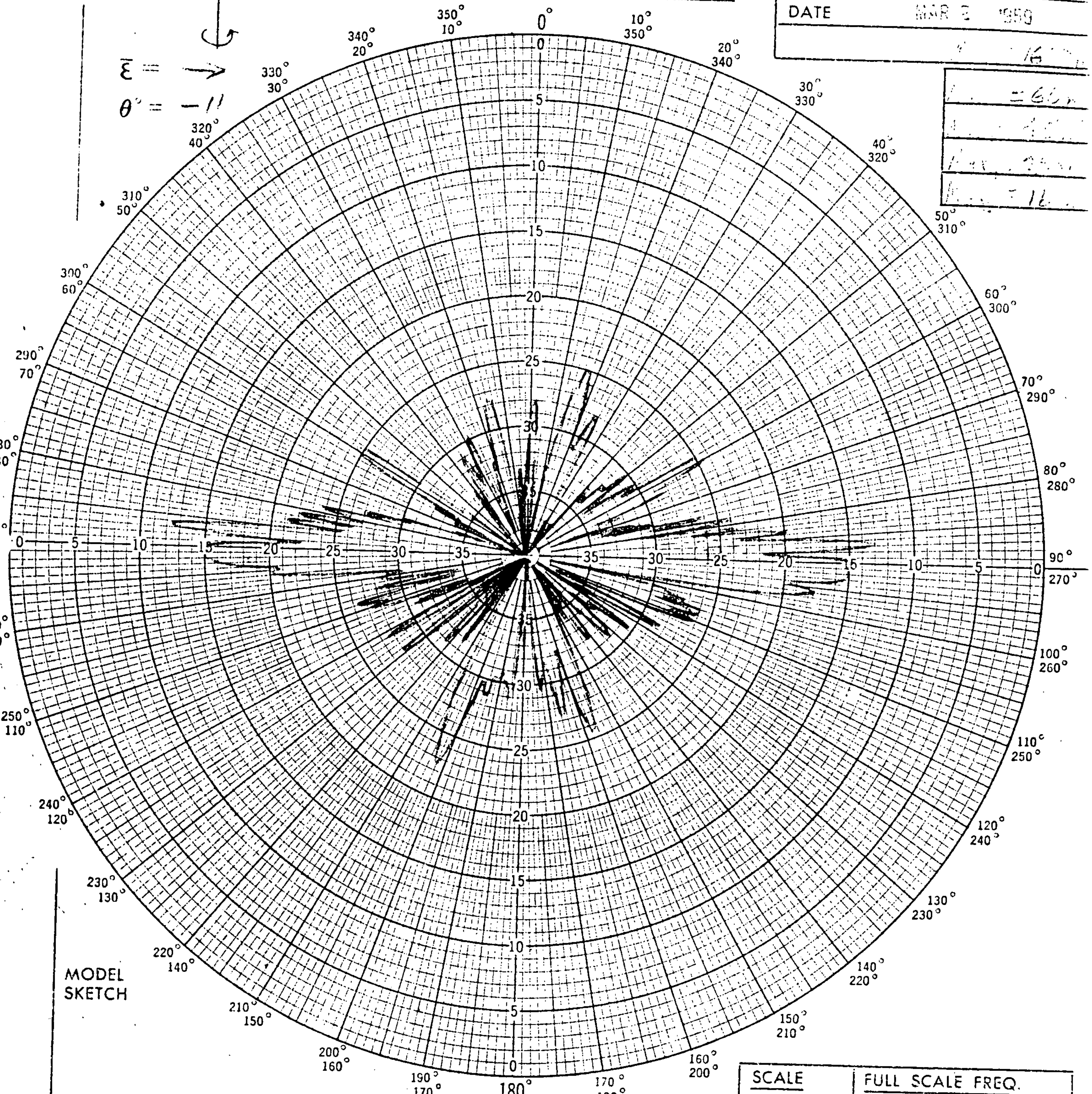


$\bar{\varepsilon}$ = →

$\theta°$ = −11

EQUIPMENT NOTES	
SOURCE: K...	R. F. ATTEN.: 0
MISC.:	

MODEL NO.	26 ... 2
TEST FREQ.	9
$\bar{\varepsilon}$ //	~~TO AXIS OF ROTATION~~ TO PLANE OF SAMPLE
RANGE	22 2
DATE	MAR 2 1959



MODEL SKETCH

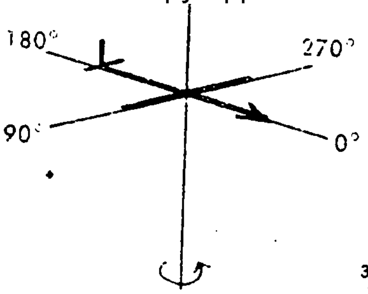
SCALE	FULL SCALE FREQ.
1/40	

BASIC MODEL:

A − 10

DETAILS:

Polar Chart No. 127D
SCIENTIFIC-ATLANTA, INC.
ATLANTA, GEORGIA

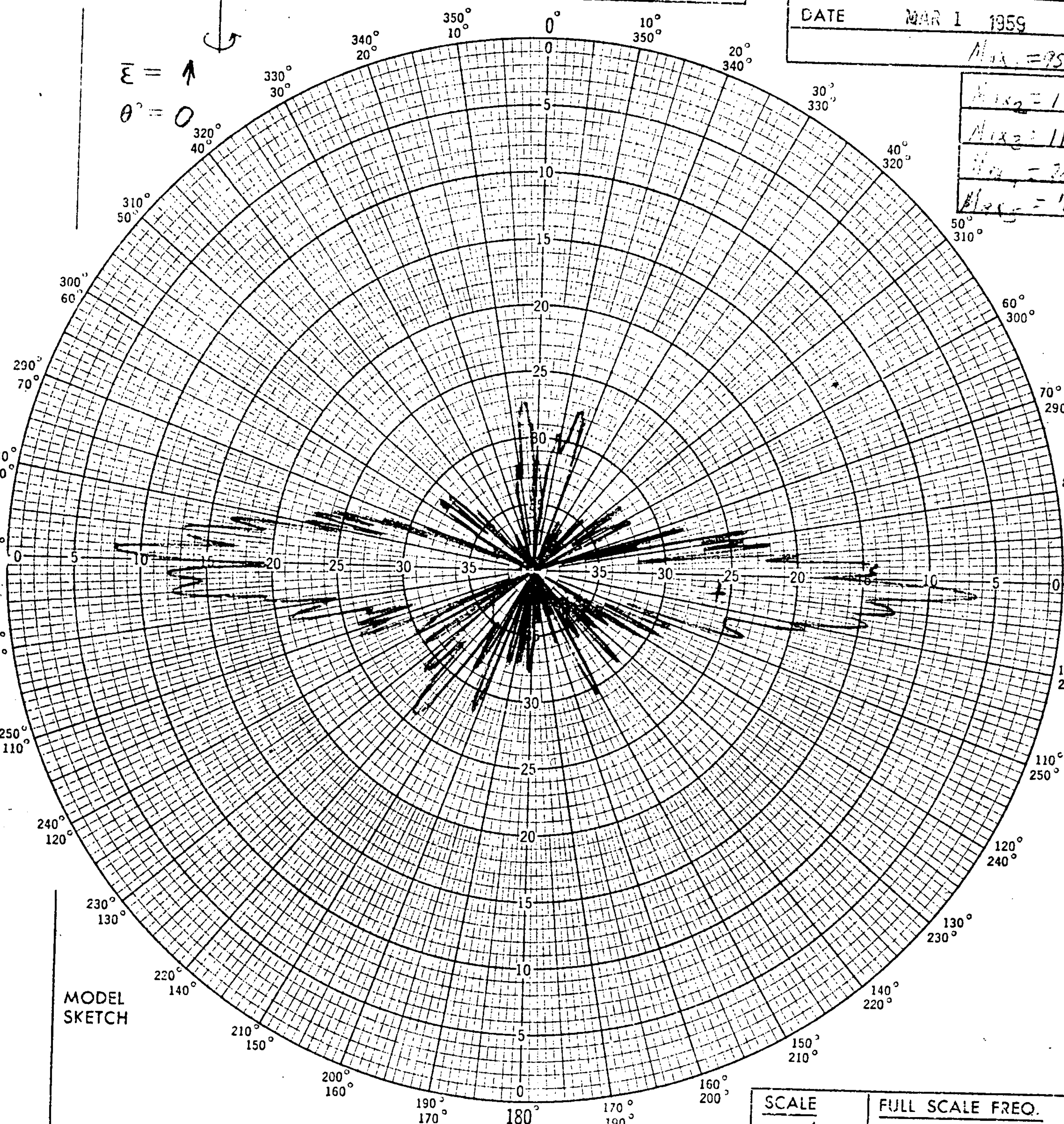


$\bar{\mathcal{E}} = \uparrow$

$\theta° = 0$

EQUIPMENT NOTES	
SOURCE: KL-1	R. F. ATTEN.: 0
MISC.:	

MODEL NO.	264-2
TEST FREQ.	9
$\bar{\mathcal{E}} \perp$	~~TO AXIS OF ROTATION~~ TO PLANE OF SAMPLE
RANGE	223
DATE	MAR 1 1959



MODEL SKETCH

SCALE	FULL SCALE FREQ.
1/40	

BASIC MODEL:

A-10

DETAILS:

Polar Chart No. 127D
SCIENTIFIC-ATLANTA, INC.
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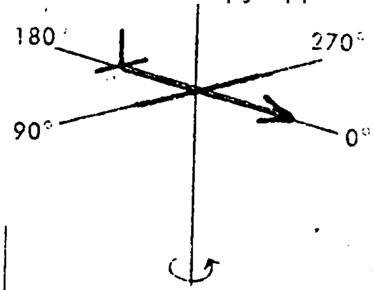


$\bar{\mathcal{E}} = \uparrow$

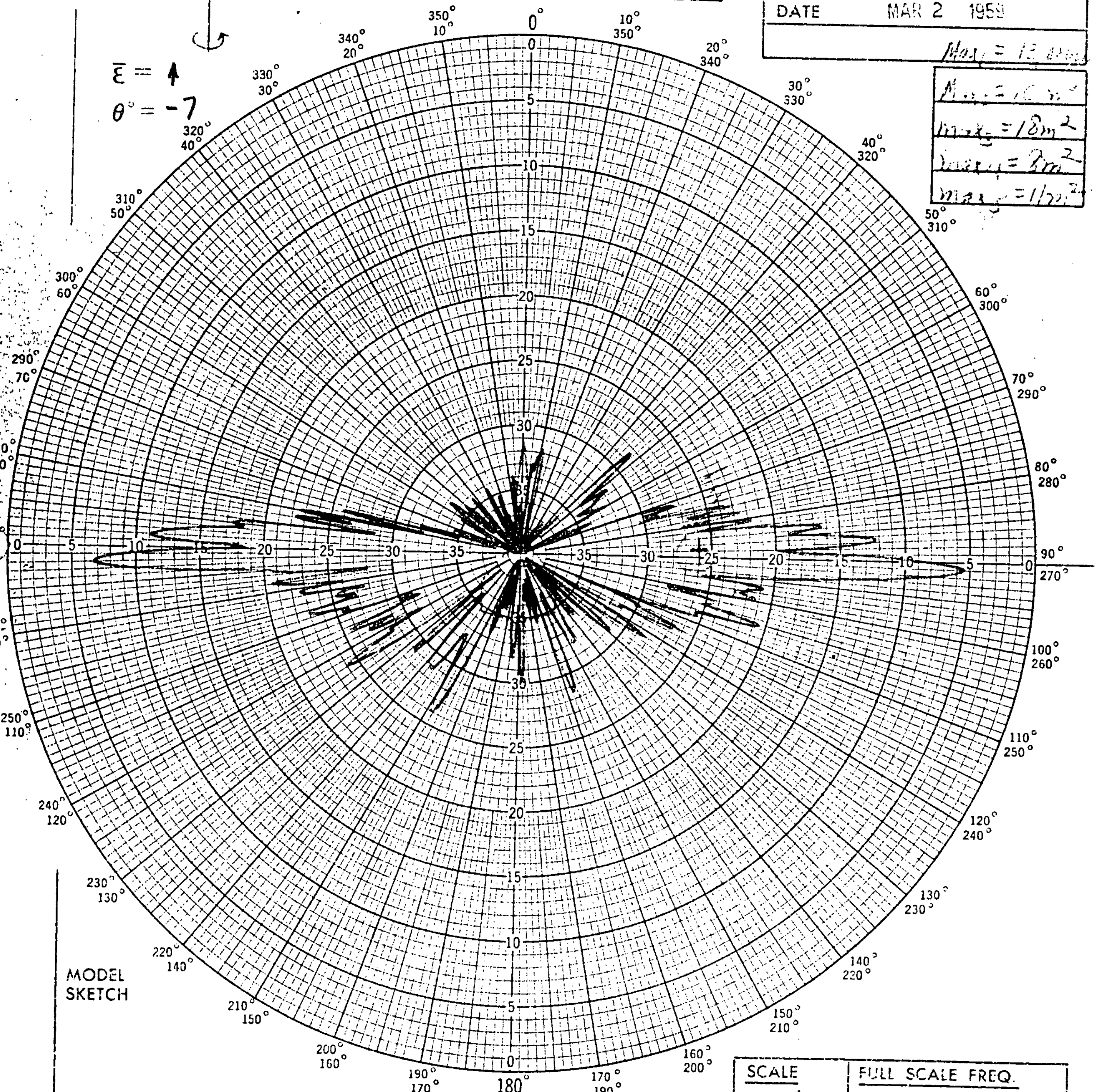
$\theta^\circ = -7$

EQUIPMENT NOTES

SOURCE: KLY	R. F. ATTEN.: 0
MISC.:	

MODEL NO.	264-2
TEST FREQ.	9
$\mathcal{E} \perp$	~~TO AXIS OF ROTATION~~ TO PLANE OF SAMPLE
RANGE	228
DATE	MAR 2 1959
	Max = 12 [illegible]

Max = 10 m²
max = 18 m²
max = 2 m²
max = 1 m²



MODEL SKETCH

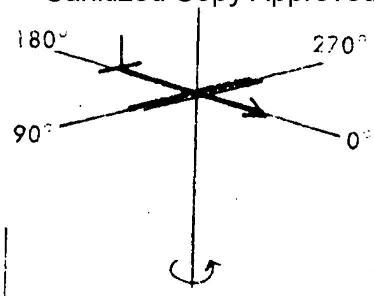
SCALE	FULL SCALE FREQ.
1/40	[illegible]

BASIC MODEL:

A-10

DETAILS:

Polar Chart No. 127D
SCIENTIFIC-ATLANTA, INC.
ATLANTA, GEORGIA



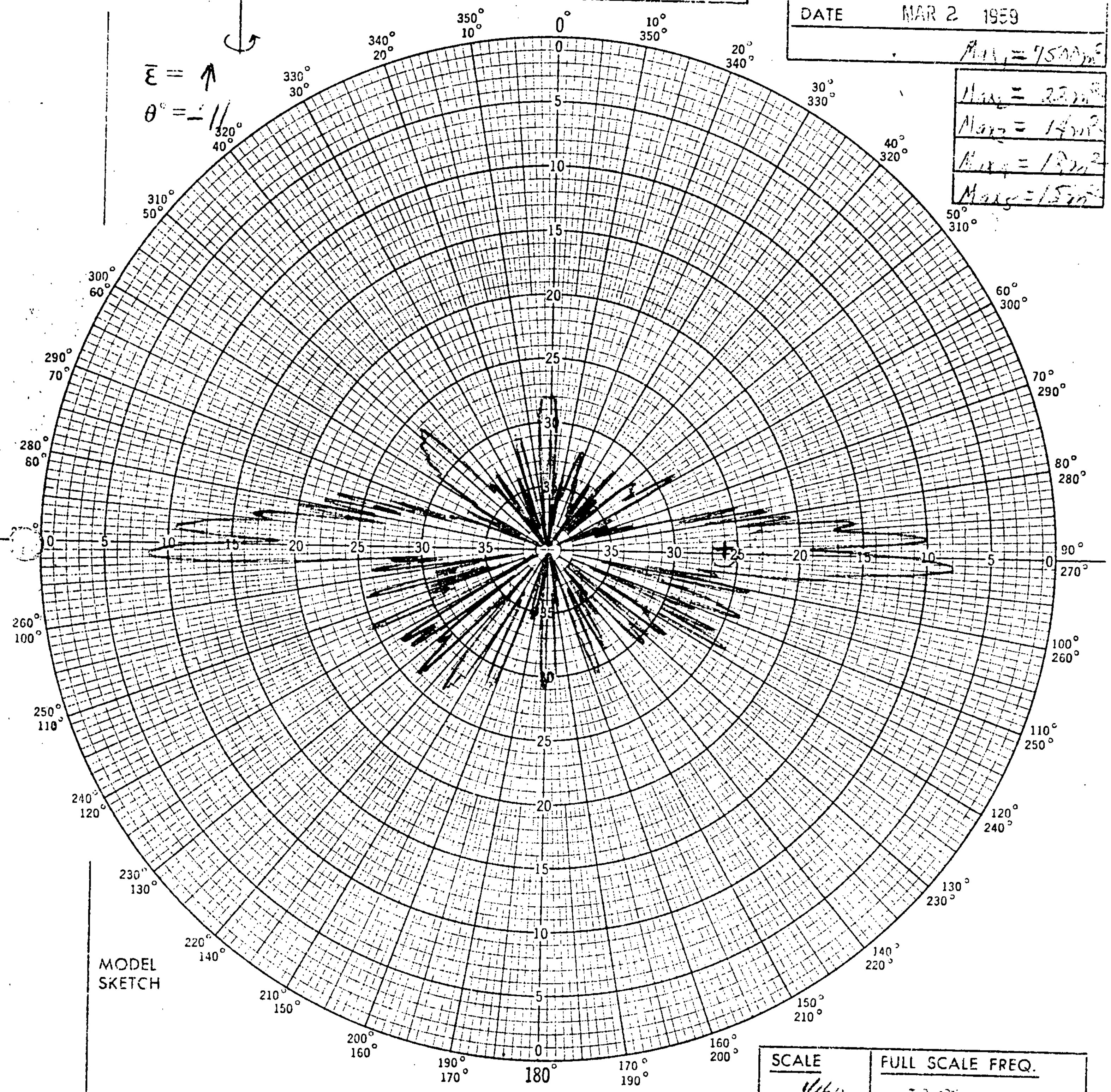
$\bar{\varepsilon} = \uparrow$

$\theta° = -11$

EQUIPMENT NOTES	
SOURCE: KLY	R. F. ATTEN.: 0
MISC.:	

MODEL NO.	264-2
TEST FREQ.	9
$\bar{\varepsilon}$ ⊥	~~TO AXIS OF ROTATION~~ TO PLANE OF SAMPLE
RANGE	228
DATE	MAR 2 1959
	$Max_1 = 750 m^2$

$Max_2 = 22 m^2$
$Max_3 = 14 m^2$
$Max_4 = 18 m^2$
$Max_5 = 15 m^2$



MODEL SKETCH

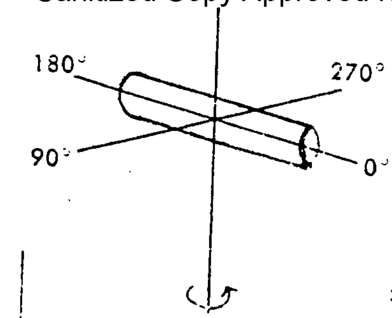
SCALE	FULL SCALE FREQ.
1/40	[illegible]

BASIC MODEL:

A-10

DETAILS:

Polar Chart No. 127D
SCIENTIFIC-ATLANTA, INC.
ATLANTA, GEORGIA

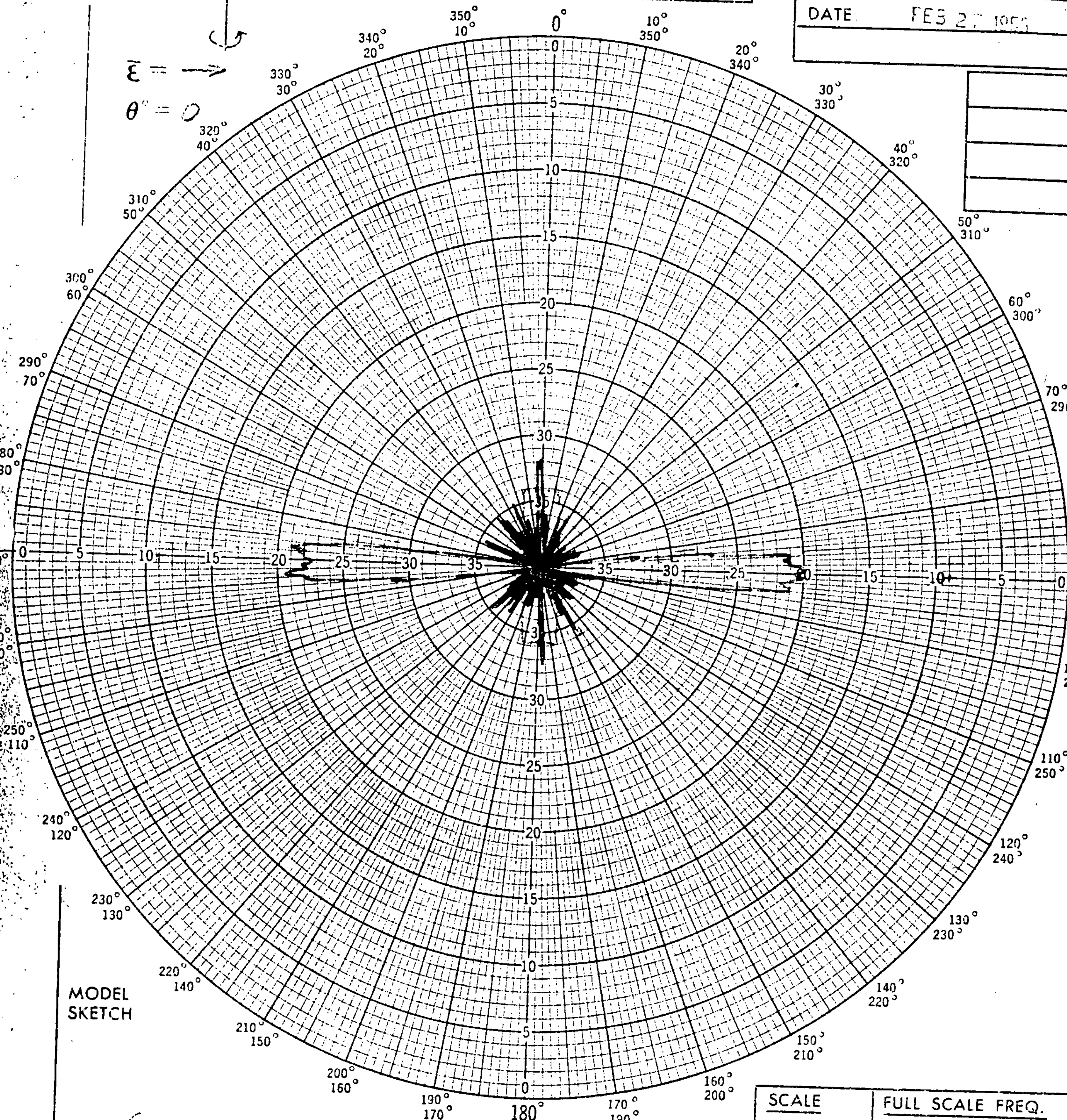


$\bar{\mathcal{E}}$ = →

$\theta°$ = 0

EQUIPMENT NOTES	
SOURCE: S. G.	R. F. ATTEN.: 0
MISC.:	

MODEL NO.	
TEST FREQ.	19 KMC
$\bar{\mathcal{E}}$ //	~~TO AXIS OF ROTATION~~ TO PLANE OF SAMPLE
RANGE	120
DATE	FEB 27 1959



MODEL SKETCH

→ 1 f

SCALE	FULL SCALE FREQ.

BASIC MODEL:

DETAILS:

Polar Chart No. 127D
SCIENTIFIC-ATLANTA, INC.
ATLANTA, GEORGIA

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A-11A

THERMODYNAMICS

A. POWER PLANT SYSTEM (cont.)

III. Induction System Performance

The same type of induction system is proposed for the A-11A airplane as that used in the A-11 airplane (Report SP-114).

B. AERODYNAMIC HEAT TRANSFER

The entire analysis presented in Report SP-114 for the A-11 airplane is applicable to the A-11A airplane.